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OF INDUSTRIAL PRODUCTION

No. 8, August 1983

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16 November 1983

# USSR REPORT ECONOMIC AFFAIRS

No. 1068

## EKO: ECONOMICS AND ORGANIZATION OF INDUSTRIAL PRODUCTION

No 8, August 1983

Except where indicated otherwise in the table of contents the following is a complete translation of the Russian-language monthly journal EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA published in Novosibirsk.

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## LENIN'S IDEAS ON PLANNING AND MANAGEMENT DISCUSSED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 83 (signed to press 13 July 1983) pp 3-15

[Article by G. M. Sorokin, corresponding member of the USSR Academy of Sciences, Institute of Economics of the USSR Academy of Sciences (Moscow): "Lenin and Planning"]

[Text] Lenin and the Gosplan, Lenin and planning--these constitute an eternally vital theme. Consulting Lenin's ideas provides life-giving nourishment to the practice of planning work and the theory of planning. Lenin was the organizer of the first Gosplan in the world. He was the initiator and inspiring influence for the first plans of the socialist state. These included, for example, the country's Food Program, which was intended for obtaining 340-440 million poods (5.6-7.2 million tons) of commercial grain with a gross yield of 43 million tons. This, of course, cannot be compared with the assignment of the present Food Program--to increase the grain yield under the 12th Five-Year Plan to 250-255 million tons and to increase correspondingly the commercial part of the yield. But in 1921 the Food Program with resources of only several hundred million poods was decisive for the destiny of our country. To distribute grain correctly and uniformly--"herein lies the basis of socialism today," said Vladimir Il'ich at that time.<sup>1</sup>

But Lenin, as nobody else, resolved immediate, everyday tasks with a revolutionary perspective. Requiring of the Gosplan plans that were dictated by the evil of the day, he also directed the development and implementation of the long-term plan for electrification which was immense in scale for that time.

Lenin has an extremely broad range of work in the area of the theory of planning. He investigated the problem of the origin of material prerequisites for planning under capitalism and also noted the inevitable future changeover to a world communist society which develops according to unified plan.

Lenin's theory of planning and his ideas about the organization of planning work constitute the basis for improving planning and control under the conditions of developed socialism. The subjects "Lenin and the Gosplan" and "Lenin and Planning" cannot be disclosed in a single work. Let us discuss only individual issues that are crucial for today.

## The Effectiveness of Planning

The main thing in planning and the work of the Gosplan, according to Lenin, is the development of a unified plan which precisely reflects the urgent needs and soberly takes into account the available resources, that is, a balanced plan, organization of its fulfillment, verification of execution; and active work. We would like to draw attention to the fact that the unified economic plan for which Lenin so fervently struggled is a comprehensively balanced plan which provides for proportional development of all branches and all aspects of the national economy. V. I. Lenin emphasized in one of his early works that conformity to the plan means constant, deliberately maintained proportionality.<sup>2</sup>

When signing the provisions concerning the state general planning commission (as the Gosplan was called at that time) in February of 1921, Vladimir Il'ich at the same time published a remarkable article, "On A Unified Economic Plan," which was a kind of manifesto of socialist planning. These works along with letters to the Gosplan, numerous statements about planning and, finally, subsequent works which are known as testaments provide an in-depth development of the problems of socialist planning and a clear definition of the role of the Gosplan in the system of state agencies. They are the condensation of the theoretical ideas and practical proposals which will for a long time to come determine the theory of planning and the principles of its organization. Lenin is responsible for the classical formula of the conditions and the major goal of socialist planning. It says: planned organization of public production with the entire society in order to provide for complete well-being and free development of all members of the society.<sup>3</sup> This goal increasingly fully and consistently defines the content of the programs for the economic and social development of the USSR for the next 5 years and the more distant future which are adopted at party congresses.

The development of planning as a vital creative activity is multifaceted. Let us note certain aspects of this process. Lenin saw in the activity of the masses the major guarantee of the success of planning. This activity is manifested both in drawing up and in implementing plans. One cannot account for all possibilities and reserves centrally. Therefore when organizing the fulfillment of the plans "... the main thing is to be able to call upon both competition and the independence of the masses in order that they will immediately get to work."<sup>4</sup> Even the best plan solves economic problems "as a close approximation." The plan for electrification which was adopted by the government and evaluated by Lenin as a "real scientific plan," as "the second program of the party" nonetheless needed "each day, in each shop and in each volost . . . to be improved, developed, perfected and changed."<sup>5</sup>

This change in plans on the basis of bringing in new reserves for increasing production and its effectiveness, of course, has nothing in common with the attempts on the part of those managers who, under the guise of "improving" the plan, try in all ways to reduce it. Competition and independence of the masses which were discussed by V. I. Lenin are called upon not only to carry out the state assignment, but also to fulfill it more efficiently, to save on raw material and fuel, to increase labor productivity and improve product quality and, if necessary, to surpass the state plan. This is precisely the way in which counter-planning is developing at leading enterprises.

The mechanism of the socialist state is created and perfected counting on the broad participation of the masses in planning and their interest in improving the economy. V. I. Lenin said that the country must be controlled, "by joining all workers together with the inseparable chains of vital interests."<sup>6</sup> The major interest of all workers is the construction of a communist society, constant improvement of well-being and perfection of the individual. It is necessary to convince each worker that this interest can be realized only through a conscientious attitude toward labor, high labor discipline and unwavering increase in labor productivity in each working position. But to do this all public labor must be organized in a planned way and results must be distributed strictly in keeping with the labor contribution--so that each worker and each labor collective knows ahead of time what measure of consumption corresponds to the measure of their labor and that remuneration will be made immediately for better work. Socialist organization of labor and distribution are a most important and complicated task of planning which was set by Lenin. Directing the efforts of the Soviet people toward carrying out this task, the November (1982) Plenum of the CPSU Central Committee emphasized the need to step up the production activity of the workers and to improve the organization of labor.

One of the most important advantages of socialism is the organization of all economic activity on the basis of democratic centralism. Yes, the state plan under socialism has the force of a directive. As Vladimir Il'ich pointed out, it is the state assignment to the proletariat. It sometimes happens that, justifiably criticizing voluntarism, people equate this to the arbitrary nature of planning. But these are different things. A tough, energetic plan, which relies on deliberate utilization of objective laws and soberly takes into account the diversity of activity, is the best way to reflect the active work of the party and state, and it has nothing in common with groundless projections. A lack of direction is no less dangerous than voluntarism. In addition to voluntarism there is also the "disease of will,"<sup>7</sup> whereby people do not know what they want and do not understand economics and politics. This is alien to the proletariat and its party, which act according to a scientifically substantiated program. "Firm" state management of the economy or, as bourgeois propaganda calls it, state dominance, is a bugbear which frightens philistines and benighted people. Under socialism, where there are no hostile classes, as the awareness and discipline of the workers, economic successes and the smoothness of the economic mechanism increase, state management of the economy should increasingly be understood as the "gentle leadership of a director."<sup>8</sup>

Centralism is only one of the aspects of administration and planning under socialism. "Democratic centralism not only does not preclude local self-administration with autonomy of areas that are distinguished by special economic and living conditions, a special national composition of the population and so forth, but, on the contrary, necessarily requires both the one and the other."<sup>9</sup> The unity is basically not violated, but supported by diversity in details, in local peculiarities and in ways of approaching the matter. "The tested principle of organization of the entire life of the socialist society," it says in an article by Comrade Yu. V. Andropov, "The Teachings of Karl Marx and Several Issues of Socialist Construction in the USSR," "is democratic centralism, which makes it possible to successfully combine free

creativity of the masses with the advantages of a unified system of scientific leadership, planning and administration."<sup>10</sup> The formation of a unified economic complex requires equally both a rigid unified plan and mobilization of local resources and reserves for guaranteed fulfillment of the statewide plan by the republics, oblasts and krais, for strengthening their motivation to develop production and increase its efficiency. A correct combination of statewide and regional planning is a complicated problem of administration which has still not been completely solved.

V. I. Lenin instructed the Gosplan to balance the plans with the existing possibilities and submit plans in which the development of branches and individual aspects of economic activity are coordinated with one another. Otherwise there arises the danger of bureaucratism. Vladimir Il'ich wrote to the Gosplan: "The greatest danger is to bureaucratize business with the plan of the state economy. This is a great danger."<sup>11</sup> "The main mistake of all of us," wrote Lenin, "has been that up to this point we have counted on the best; and from this we have fallen into bureaucratic utopias. We have realized an insignificant proportion of our plans. Life has laughed at the plans, everyone has laughed."<sup>12</sup> This is now ancient history. But even in our day there are such bureaucratic planning projections. Their danger consists in that they do not involve the interests of the people, they do not inspire labor enthusiasm, and the economic mechanism begins to run idle.

The plan should be reinforced with a flexible system of measures for implementing it. One of Lenin's advisors and the first chairman of the Gosplan, G. M. Krzhizhanovskiy, called for avoiding such planning constructions which "could end up being the henchmen of the Spanish Inquisition for the development of our national economy."<sup>13</sup>

At the turning points of history the ways of implementing the plan also change. Let us recall that the changeover to the NEP was regarded by many as a rejection of planned management. But this is not so. Lenin then organized the Gosplan and explained that the "new economic policy does not change the unified economic plan and does not go beyond its framework, but changes the approach to its implementation."<sup>14</sup> Administration through branch main administrations has given way to economic maneuvering. And developed socialism also has its own approach to the implementation of the state plan. It becomes possible to coordinate more closely the fulfillment of the plan with the improved well-being, the expanded reproduction of the labor force, and the equalization of the incomes of the workers and peasants; to introduce normatives that are in effect for a long time which regulate the relations between the state and enterprises, and also among enterprises; and to stimulate the final results and quality indicators of the work both in the branches of material production and in the sphere of services. Not all the effective ways of implementing the plan have been found yet, and they are not always introduced into practice reliably or even with the legitimate amount of energy and consistency. The work for improving the economic mechanism of the socialist society is continuing.

Lenin assigned the Gosplan an exceptional role in the system of state agencies. He assigned the first group of individuals to the Gosplan, determined the provisions for it and helped to organize the work. In his words, the Gosplan is

primarily a group of knowledgeable people, representatives of science and technology, who have the greatest amount of information for a correct judgment about matters.<sup>15</sup> The Gosplan is guided by the Central Committee and Government, and the communists who are in charge of the Gosplan, along with skillful administration, skillfully enlist knowledgeable people. Gosplan workers are knowledgeable business people who are alien to scholasticism who have the ability without "an abundance of phrases, fuss, elaboration and chatter about plans, systems and so forth"<sup>16</sup> to arrange the necessary matter. These are people who have studied in detail the fulfillment of our plans and the mistakes in drawing them up and implementing them.

Lenin protected the Gosplan from minor issues, from "vermicelli" and thought that its task was to use consolidated funds to develop large statewide problems. When Trotskiy accused the Gosplan of academism, Lenin decisively objected and pointed out that the shortcomings "should be sought not in academism, but in the opposite direction."<sup>17</sup> Vladimir Il'ich considered it an especially important task of the Gosplan to check on the fulfillment of plans, the organization of their implementation, that is, the development of effective measures that provide for the implementation of plans. He considered it necessary to distribute duties among Gosplan members in such a way that they would unwaveringly check on the fulfillment of plans. "To check unwaveringly means to be responsible to the chief for efficient consumption of fuel and bread, for maximum procurements of one thing or another, for maximum shipments, for economizing on fuel (in industry, and so forth and so on), for economizing on food (to feed only good workers), increasing labor productivity, and so forth."<sup>18</sup> Without systematic observance of the fulfillment of the plan there can be no effective planning. Without work on observance of the fulfillment of the plan everything is reduced to zero, Lenin wrote.<sup>19</sup> More activity on the part of the planning staffs in the area of the organization of the fulfillment of the plan could even now significantly improve the functioning of the economic mechanism. Lenin did not stop thinking about improving socialist planning, and in one of his latest articles he advanced a far-reaching proposal "to give legislative significance under certain conditions to Gosplan decisions."<sup>20</sup>

### The Role of Long-Range Planning

We should like to especially recall V. I. Lenin's ideas about the long-range economic plan. "It is necessary to enlist the mass of workers and conscientious peasants in the large program for 10-20 years,"<sup>21</sup> said V. I. Lenin. "One cannot work without a plan that is intended for a long-range period and for significant success." And, finally, "Do not be afraid of plans that are calculated for a large number of years: economic regeneration cannot take place without them. . . ."<sup>22</sup> Lenin called for more than the construction of a long-range plan. Under his leadership they drew up and began to implement the plan for electrification which was intended for 15-20 years, and was fulfilled and overfulfilled within this time period. Even now Lenin's appeal for work on the basis of a long-range plan is of primary significance.

In order to carry out such large tasks as the achievement of a classless society, technical re-equipment of the national economy and its transfer to an intensive basis of development, superiority over advanced capitalist countries



in terms of the level of labor productivity and consumption, and economic integration of the socialist countries, a general (long-range) economic plan is needed. It is intended to draw up a comprehensive program for scientific and technical progress for 20 years, the basic directions for economic and social development for 10 years, and the state five-year plan.

After the sparkling success of the plan for electrification (GOELRO) we had no long-range general plans that were comparable in scope and final results to the GOELRO plan. Before the war we had: plans of the commission for the general plan (1926), the hypothesis concerning the development of the national economy in the general plan (1930), materials for the general plan for electrification (1932-1933), and the rough draft of the general plan for 15 years (1940-1941). These were not quite successful and incomplete works, which fact was conditioned historically. After the war in 1947-1948 the Gosplan prepared calculations for the general plan. In 1956 a 15-year program was adopted for electrification of the railways. In 1957 a prediction was made of the development of industry in the next 15 years. In 1959 a 20-year program for electrification was prepared. At the 22nd CPSU Congress (1961) they gave the plans for the economic development of the USSR up to 1980, and some of them were included in the party program. In 1963 they approved the long-range plan for the development of the chemical industry and food production. In subsequent years the Academy of Sciences has been working on long-range technical progress and its social consequences.

In our opinion, enough material has been accumulated to draw conclusions about improving the methodology of long-range planning. As V. I. Lenin did with respect to the GOELRO in the article "On a Unified Economic Plan," it is necessary to develop scrupulously the methodological points of the aforementioned variants, their strong and weak points, and their obvious mistakes, and to determine measures for improving long-range planning. Economists have still not done this work. And since this is the case the words of Lenin sound like an order and a reproach: "It is necessary for economists, literary men and statisticians not to prattle about the plan in general, but to study in detail the implementation of our plan, our mistakes in this practical matter, and ways of eliminating these mistakes. Without this study we are blind."<sup>23</sup>

The final drafts of the general plan, which were developed at the end of the 1940's for a period of 15 years, were selected in 1965. If they are compared with the actual results one receives the following picture.

In many cases the rough drafts for the development of industry were reduced, and for agriculture and the branches that work with agricultural raw material they were unrealistic. One of the most vulnerable points in the drafts were plans in the area of technical advancement and, as a result, the effectiveness of production. This kind of shortcoming is inherent in many of the proposals of institutes that are working in our day on hypotheses concerning technical development. Here again the instructions of V. I. Lenin to those who were drawing up the GOELRO are invaluable. First of all one should note the fundamental Leninist point about searching out in the general plan a new and advanced technical substantiation. It would be ridiculous and uncivilized, wrote Vladimir Il'ich, to base the progressive development on old technical equipment.

Electrification was the new technical foundation for the GOELRO plan. A new technical foundation should be revolutionary, but not speculative. We need "broad plans not taken from fantasy, but reinforced by technology and prepared by science."<sup>24</sup>

Table. Indicators of the National Economy From Drafts of the General Plan and Actual From Results of the Development of the USSR National Economy in 1940-1965.

Indicators, 1965	Plan	Actual	Fulfillment of Plans, %
National income, %	460	600	130
Industrial output, %	520	790	152
Agricultural output, %	290	180	62
Labor productivity in industry, %	330	370	112
Labor productivity in agriculture, %	450	240	53
Iron, millions of tons	60-65	66.2	102-110
Coal, millions of tons	650-700	578	83-89
Petroleum, millions of tons	120	243	200
Electric energy, billions of kilowatt-hours	325	507	156
Gas, billions of cubic meters	87	128	148
Cement, millions of tons	50	72.4	144
Cotton fabric, billions of square meters	12.5	5.5	44
Woolen fabric, millions of square meters	700	466	62
Leather footwear, millions of pair	675	486	72
Sugar, millions of tons	9	11	122

It seems to us that even now when preparing long-range plans, possibly the most difficult task is to find a new technical basis that produces an appreciable economic effect. The scientific press has many assertions that in the foreseeable future there will inevitably be a rise in the cost of raw material, fuel and even machines. There are many specialists who think that the time of cheap energy resources is gone for good. But if this is the case, if this is the destiny of all branches of industry, we have revealed an ungratifying picture of the general reduction of production efficiency. The new technical substantiation of the long-range plan should lead to a turnabout of unfavorable tendencies. Herein lies the task of those who draw up hypotheses of technical progress.

Science was faced with this problem in the past, and short-sighted scientists predicted the inevitability of the decline of productivity of subsequent expenditures in farming. V. I. Lenin refuted such theories, pointing out that the progress of technology is capable of preventing a decline in the productivity of new investments. There is no doubt that to search out means of production and technological systems that lead to a reduction of total expenditures of labor per unit of output is a complicated and difficult matter, but, as history shows, it is also a necessary and possible one. To search out paths of scientific and technical progress that are necessarily related to economic effectiveness is an insistent demand made by V. I. Lenin on those who draw up the plans.



There is another extremely important instruction from Lenin concerning the approach to effectiveness. It pertains to the year 1918 when he was working on the fundamental issues of socialist development--the next tasks of soviet power. Considering it necessary to draw up more rapidly the plan for reorganization of industry and the economic advancement of Russia, he suggested that this plan should include "efficient distribution of industry in Russia from the standpoint of the proximity of raw material and the possibilities of the least losses of labor when changing over from processing raw material to all the subsequent stages of processing semimanufactured products right down to obtaining the final product."<sup>25</sup> The disclosure of the effectiveness of the final result (prepared product) taking into account expenditures in all stages of production and circulation is a crucial task of our time. To reveal the total expenditures of labor in individual stages of production, to which we are frequently limited, does not solve the problem of obtaining high effectiveness of the final product. This is especially clear from the example of agriculture. The effect from obtaining a large yield with low labor expenditures in the subsequent stages (harvesting, transportation, storage and processing) can be largely reduced. The increased volumes of production, the prolonged stages of processing raw material, and the complicated phases of circulation--the entire progressive process of vertical integration of production--makes more insistent the proposal to reveal not only the effect of the final product, but also of all preceding stages of the transformation of raw material and semimanufactured products into the final product and the stages of their circulation.

In addition to the general, extraordinary penetrating and more particular instructions of Vladimir Il'ich concerning the organization of work on the plan for scientific and technical development, Lenin frequently personalized the assignments for scientists: such and such should be done by Vinter, Shatelen, Krug, Strumilin and so forth. The drawing up of the GOELRO plan was also personalized. Personal assignments from the government to individual scientists, and not institutions, and direct content corresponds most fully to the merits of the scientist and increases his responsibility for the development of plans. Lenin protected scientists from bureaucrats and thought it inadmissible to "tie the hands of hundreds of the best specialists," requiring that we "learn to value science and reject the 'communist' arrogance of dilettantes and bureaucrats."<sup>26</sup> Vladimir Il'ich was concerned about providing the necessary information to planners and familiarizing them "with European and American technical equipment precisely, promptly and practically, and not in a meaningless conventional way. In particular, Moscow must have one model of all the latest most important machines in order to learn and teach."<sup>27</sup> Additionally, Lenin points out the need to check on the conscientiousness of the fulfillment of commitments by scientists and thought it necessary "to catch" those inactive and pedantic scientists who have missed the opportunities of foreign experience."<sup>28</sup>

Every time we think about the difficult questions of improving the administration of the economy and its planning, we turn with profound gratitude and satisfaction to the wise counsel of Vladimir Il'ich. The genius Lenin illuminates the path to communism.

#### FOOTNOTES

1. See Lenin, V. I. "Poln. sobr. soch." [Collected Works], Vol 36, p 504.
2. Ibid., Vol 3, p 620.
3. Ibid., Vol 6, p 232.
4. Ibid., Vol 52, p 39.
5. Ibid., Vol 42, p 158.
6. Ibid., Vol 35, p 287.
7. Ibid., Vol 45, p 8.
8. Ibid., Vol 36, p 200.
9. Ibid., Vol 24, p 144.
10. KOMMUNIST, 1983, No 3, p 19.
11. Lenin, V. I. "Poln. sobr. soch.," Vol 52, p 76.
12. Ibid., Vol 44, p 63.
13. Krzhizhanovskiy, G. M., "Problemy planirovaniya" [Problems of Planning], Ob'yedinennoye nauchno-tekhnicheskoye izdatel'stvo, Moscow-Leningrad, 1934, p 291.
14. Lenin, V. I. "Poln. sobr. soch.," Vol 54, p 101.
15. Ibid., Vol 45, p 349.
16. Ibid.
17. Ibid., Vol 45, p 182.
18. Ibid., Vol 44, p 64.
19. Ibid., Vol 54, p 179.
20. Ibid., Vol 45, p 343.
21. Ibid., Vol 40, p 63.
22. Ibid., Vol 42, pp 153-154.
23. Ibid., Vol 42, p 344.
24. Ibid., Vol 40, p 108.

25. Ibid., Vol 36, p 228.

26. Ibid., Vol 42, p 344.

27. Ibid., Vol 53, p 164.

28. Ibid., Vol 54, p 98.

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## LEADING ECONOMISTS, MANAGERS ANALYZE NEED FOR ECONOMIC REORGANIZATION

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 83 (signed to press 13 July 1983) pp 16-49

[Round-table discussion led by Academician A. G. Aganbegyan, EKO editor-in-chief: "Decisive Restructuring is Needed"]

[Text] One cannot but see first of all that our work directed toward improving and restructuring the economic mechanism, forms and methods of administration have lagged behind the requirements set by the level of material-technical, social and spiritual development that has been achieved in the Soviet society.

Yu. V. Andropov

Four years have passed since the adoption of the decree by the CPSU Central Committee and the USSR Council of Ministers of 12 July 1979, "On Improving Planning and Stepping Up the Influence of the Economic Mechanism on Increasing the Effectiveness of Production and the Quality of Work."

What has been done in the time that has passed? And what issues remain unresolved? The EKO round-table, in which economic managers, workers of planning agencies and scientists participated, was devoted to these problems.

Participating in the discussion were:

L. I. Abalkin, doctor of economic sciences, head of the political economics department of the Academy of Social Sciences under the CPSU Central Committee;

R. A. Belousov, doctor of economic sciences, head of the department of control of socio-economic processes of the Academy of Social Sciences under the CPSU Central Committee;

A. I. Buzhinskiy, deputy general director of the Moscow Automotive Plant imeni I. A. Likhachev (ZIL production association);

P. G. Bunich, corresponding member of the USSR Academy of Sciences, head of the department of the economic mechanism for control of the socialist economy of the Moscow Institute of Administration imeni S. Ordzhonikidze;

G. A. Yegiazaryan, doctor of economic sciences, head of the department of economics of industry of the economics faculty of the Moscow State University imeni M. V. Lomonosov;

G. V. Zhuk, chief of the finance administration of the USSR Ministry of the Petroleum Refining and Petrochemical Industry;

V. P. Moskalenko, deputy general director for economic problems of the Sumy Machine Building Production Association imeni M. V. Frunze;

V. P. Serikov, deputy director of the Center for Scientific Organization of Labor of the USSR Ministry of Heavy and Transport Machine Building, Hero of Socialist Labor;

O. V. Fedorov, chief of the division for organization of control systems and processes of the USSR Ministry of the Electrical Equipment Industry;

O. M. Yun', deputy chief of the division for improving planning and economic stimulation of the USSR Gosplan;

Yu. I. Yushkov, general director of the scientific production association for mining machine building, Sverdlovsk.

The discussion was led by the magazine's editor-in-chief, Academician A. G. Aganbegyan.

#### Balance, Stability, Reserves

A. G. Aganbegyan: Our country is doing a certain amount of work to implement the measures earmarked by the July (1979) decree of the CPSU Central Committee and the USSR Council of Ministers. At the beginning of 1983 16 of the 37 industrial ministries applied the indicator of normative net output, and the sphere of its application is expanding. In construction a number of organizations are introducing the indicator of conventional net output and calculations for projects that are finally released for operation. Many enterprises are changing over to direct long-term ties. The fulfillment of commitments under contracts is becoming one of the main evaluation indicators. A number of ministries are using the normative of wages per ruble of output in planning. New wholesale prices have been introduced in industry. The application of brigade forms of organization and payment for labor is expanding. One can give other examples of enterprises changing over to new modes of operation.

But all this is only a small part of the broad complex of measures for improving the economic mechanism. We have not resolved such important problems as balance of national economic plans, the changeover to planning on the basis of the five-year period, the motivation of associations (enterprises) to adopt more difficult planning assignments, or accelerated introduction of the achievements of science into production. In industrial management, as before, there is a predominance of trivial administrative matters on the part of the ministry concerning the activity of the associations and enterprises, and the independence

of the latter has not increased. The work of the branches, associations and enterprises is not sufficiently directed toward satisfying the growing public needs. The primacy of the producers remains, and the consumers are in a worse position. They must fight for the supplies of raw and processed materials they are supposed to have, "beg" construction contractors to put planned projects into operation on time, "get on their knees" before the railroads in order to obtain the cars they are supposed to have for shipping products, and so forth.

And the main thing is that all of the measures that have been taken for improving the economic mechanism are still not producing the desired return. As was pointed out at the November (1982) Plenum of the CPSU Central Committee, labor productivity is increasing at slow rates, the material-intensiveness of products is practically not decreasing, and the changeover to effectiveness is being carried out slowly. As was previously the case, the plans are being fulfilled at the cost of large expenditures and outlays. The force of inertia and being accustomed to old ways are still stronger than particular measures for improving the system of administration. In my opinion, we need comprehensive, radical measures. Apparently we should be speaking about a radical restructuring of the economic mechanism in the areas indicated by Comrade Yu. V. Andropov at the November Plenum. It is important for workers of planning agencies, scientists and economic executives to jointly reveal the loopholes in today's economy and develop concrete measures for radically improving the system of management.

L. I. Abalkin: If one is to speak about the principle directions for restructuring the mechanism and methods of management, the first thing that must be done is to provide for real balance of the economy, substantiation and stability of the five-year plan. The modern economy with its complicated and constantly deepening system of economic ties cannot function effectively under the conditions of chronic shortage and imbalance in the most important proportions. The utilization of the achievements of the scientific and technical revolution and the development of production specialization, which are so necessary today, cannot in principle be regulated by on-the-spot decisions, and they require the creation of stable and sufficiently long-range prospects for each economic unit.

One must say quite definitely: to approve unbalanced plans is to ignore the objective requirements of proportionality. The formula for searching out reserves to cover shortages "during the course of the fulfillment of the plan" subverts the organizational role of the plans and is tantamount to hoping for an off-chance, that everything will turn out one way or another.

Balance of plans is also a necessary prerequisite for introducing an effective system of khozraschet stimulation of production, which is based on stable economic normatives.

Of course, the matter certainly cannot be reduced to simple arithmetic coordination of proportions. Balance can be provided only by strengthening the normative base of planning, and actually controlling the process for increasing the effectiveness of the resources that are utilized. There are also problems whose solutions cannot be delayed: strengthening labor and executive discipline, eliminating direct losses and so forth.

But still radically improving the economic mechanism and raising it to a qualitatively new level should begin precisely with planning, with increasing its scientific substantiation and achieving complete and effective balance.

G. V. Zhuk: Indeed, the question of the substantiation of five-year plans of enterprises, balance of their divisions and stability is one of the most important ones. Our ministry of the petroleum refining and petrochemical industry has undertaken measures to improve the quality of the plan for the 11th Five-Year Plan. It was submitted to production associations and enterprises 8 months before the beginning of the planning period. In conjunction with local party and soviet agencies of a number of republics and regions of the country, Azerbaijan and Turkmenia, the Bashkir and Tatar ASSR's, Krasnoyarsk Kray and Omsk and Irkutsk Oblasts have drawn up territorial plans for the development of the petroleum refining and petrochemical industry for the 11th Five-Year Plan and the period up to 1990. Nonetheless the five-year plan still does not fully meet the requirements of balance of all divisions and stability of implementation.

What caused this? In the first place, for this five-year plan the ministries were not given plans for material and technical supply, that is, the plan was not balanced with material resources.

In the second place, the assignments for increasing production capacities did not correspond to the volumes of capital investments. After the five-year plan was drawn up, the volume of capital investments planned for us was decreased by 1.5 billion rubles.

In the third place, the production plan was not balanced with the transportation capabilities. Previously when drawing up a production plan we did not take into account the capabilities of transportation in the branch as a whole and in individual regions. Now this lack of balance is being felt. Thus in 1981-1982 we failed to process a considerable quantity of petroleum. In keeping with the instructions of the November (1982) Plenum of the CPSU Central Committee, the operation of transportation should be radically improved and we are waiting impatiently for this. The lack of balance of individual sections of the plan has led to a situation where the five-year plan has become unstable.

This instability of the plan could have been avoided if we had fulfilled an important point of the July decree--concerning creating reserves and controlling them. But now any deviation in the demand for petroleum products or other items requires changes in planning indicators. In the first quarter of 1982, for example, 15 changes were made in the plans for producing petroleum products, which caused 46 adjustments in the planning assignments for individual enterprises.

O. M. Yun': I should like to clarify something. According to the aforementioned decree, normatives of expenditures were developed for 200 kinds of resources and reserves have been envisioned for them. But the reserves were established in inadequate amounts, and they were oriented only toward eliminating natural disasters and not toward disproportions which arose during the course of the implementation of the plan. Of course, when the volumes of reserves

are inadequate it is difficult to maintain a constant balance of the economy. This leads to a situation where in order to provide for rhythmic work at the enterprises, above-normative stocks are created and they are growing twice as rapidly as the production volumes are. Even products that are in the shortest supply pile up at individual enterprises, but, as a rule, not in the ones where they are needed in this case. Since the increase in supplies as a result of production inevitably leads to a reduction of the rates of our development, it is expedient to create a mechanism for redistributing supplies and increasing national economic reserves.

R. A. Belousov: I agree that the solution to the problem of reserves is very important. But even more important, in my opinion, is to overcome the lack of balance in the circulation of material and financial funds. A serious question arises here: How to avoid a lack of balance in supply, which has had a tendency toward increasing in recent years? Before answering this question one should clarify the reasons for the disproportions in the satisfaction of the needs of the national economy. The material balance is the ratio between the concrete needs and the resources. Can one say that we do not have enough metal, coal, gas, petroleum, feeds, timber, cement and other implements of labor? No, one cannot. In terms of the extraction and production of the primary kinds of raw material and energy, the Soviet Union holds the leading position in the world, and there should be enough of them for continuous supply of all consumers. Perhaps the demands are too high? Of course, a considerable amount of the national income is expended on accumulation. But final consumption--the direct satisfaction of the needs of the population--can in no way be considered to be too high. So what is the reason for the lack of balance if there are apparently enough resources and the demands are not too high?

The reason lies primarily in the poor effectiveness of the utilization of the resources themselves, which is reflected in excessively high proportional normative expenditures on the final useful product, and thus on the satisfaction of the needs. A good deal of metal is expended on a machine; a good deal of cement, timber and glass--on the construction of a residential building or a production facility; a good deal of feed--on the production of meat, and so forth. Modern technology makes it possible to reduce such normatives to two-thirds-one-half of the previous level. This would eliminate the shortage of resources and create prerequisites for changing over to a balanced economy.

In order to assimilate this technology it is necessary to have a high art of production, organization of labor and administration, and the corresponding reorientation and retraining of administrative personnel. They must master analysis and methods of evaluating the useful results and expenditures, create a largely new set of instruments--consolidated normatives for the expenditure of resources that are close to the normatives of publicly necessary expenditures; and skillfully utilize them for controlling factors in the growth of effectiveness.

G. V. Zhuk: Shortcomings in the development of five-year and annual assignments are also explained by the fact that there is no legislative act that regulates the policy and responsibility for the development of plans by higher organizations, even though the legislation regulates in detail the activity of industrial enterprises and their responsibility for the fulfillment of planned assignments. I think that it is necessary to draft and enact a law concerning



planning, material and technical supply, and sales, which would stipulate the responsibility of planning, supply and other agencies for the balance and substantiation of the plans.

L. I. Abalkin: Apparently it is time to begin to develop and consistently implement a special program whose goal is to overcome the loopholes and change over to economic growth on a balanced basis. The requirement for balance can be fully realized with the development of the 12th Five-Year Plan for economic and social development. This will require strictly observing the principles of its development that are envisioned by the 1979 decree for improving the economic mechanism.

One should in all ways avoid decisions and actions which could violate the proportions established in the plan and thus undermine the basis of economic growth.

R. A. Belousov: I think that if such a program were developed it would essentially be a program for increasing the effectiveness of the entire process of reproduction, that is, a qualitatively new national economic plan.

G. V. Zhuk: Another important issue. It is necessary, finally, to change over in action to the five-year plan as the main form of planning. The annual plans should not be drawn up anew each year. If necessary individual indicators of the five-year plan should be refined for the subsequent year and these refinements should be coordinated, but a new plan should not be drawn up each year for the entire immense list of indicators. For tens of thousands of people must be employed in this.

O. M. Yun': Yes, in keeping with the aforementioned decree, the plan, for example, for 1983 should be drawn up from below on the basis of the five-year plan and the assignments envisioned in it. The forms are submitted to the ministries and departments, but they do not indicate the control figures as was previously the case. It is assumed that the ministries and associations will draw up counterplans for 1983 on the basis of the assignments of the five-year plan. An inspection has shown that even the five-year plan has not been submitted to all associations. It is necessary to raise the role of planning discipline and increase the responsibility at all levels of planning.

G. V. Zhuk: The existing system of planning indicators also cause serious remarks. The number of these indicators is excessively large. According to the production list, the Council of Ministers, the Gosplan, the Gossnab and other higher organizations establish 2,000 positions for us, for science--1,054, and for construction--about 2,500. Each list of titles has 10-15 positions, which neither the ministry nor the enterprises can change since they are controlled by the Stroybank. The 1979 decree orients us toward expanding the economic methods of administration, particularly financial ones, since the final goal is to change over to autonomous financing in industry on the basis of long-term normatives for the distribution of profit and wages. It would seem that, in keeping with this, three indicators should be established: the normative of wages, the normative of profit and the fulfillment of commitments according to agreements. But a multitude of indicators are given, which cannot be changed without the agreement of various organizations.

Wherein lies the contradiction here? The Gosplan, the Gossnab and other unionwide departments think that if they do not plan some particular position, something will happen. Each commands at its own level, and the initiative of the enterprises is held back.

R. A. Belousov: Indeed, the USSR Gosplan and Gossnab have taken on more than they can handle--centralized distribution of most of the implements of labor, machines, equipment and means of transportation. These agencies are proud of the fact that through material balances they embrace the movement of 80-90 percent of the gross output. But can they actually control and effectively direct these immense flows of extremely diverse products?

The assortment of items produced in the national economy now amounts to about 20 million kinds and type sizes. Among their producers and consumers are 44,000 independent industrial enterprises and associations, 32,000 construction organizations, and 47,000 kolkhozes and sovkhozes. Products are sold to the population through 1 million retail trade and public catering enterprises. It is easy to calculate that the overall number of extremely mobile and dynamic interbusiness ties, in terms of the exchange and sales of products, number in the many billions of concrete items, services and monetary exchanges. Is it possible or necessary for all these material and financial flows to pass through central administrative agencies, which will "drown" in them? Are not too much time and effort spent on searching for a compromise solution in situations where one party is demanding more resources, including capital investments, and trying to take on fewer commitments, while another, conversely, is trying to "squeeze out" more products and allot fewer resources?

O. M. Yun': The central administrative agencies determine only the basic material and value proportions. When developing the annual plan the USSR Gosplan, for example, draws up 2,000 single-product balances, the Gossnab--up to 15,000, and the ministries--50,000 each. In this list of products the production assignments are sent to the associations, administrations and organizations (and there are more than 100,000 of them). Further detailization of the products list and also the determination of the specific consumer qualities of the products are done by the supply enterprises and the consumers when agreements are concluded.

The problem consists in providing for coordination of physical and value proportions at each level of administration, between these levels and among the periods of planning. The balance of the plan is undoubtedly a necessary condition for effective functioning of the economy. But the balance itself is provided not only by planning agencies, but by the entire economic mechanism which in each enterprise and each administrative agency should create motivation and stimuli to eliminate the disproportions that arise.

G. V. Zhuk: There are no scientific developments pertaining to the indicators and the level on which they should be planned.

We are bothered by the lack of such an indicator as the expected fulfillment of the plan in terms of capital construction. Shortcomings in capital construction are exacerbated by the fact that when drawing up the production plan we

think that the plan for capital construction will be fulfilled. Proceeding from this, the Gosplan plans products, and the Gosstab distributes them. In the final analysis, as a rule, the plan for capital construction is not completely fulfilled, and this undermines the fulfillment of the production plans. This situation complicates all the work, the more so since the financing of construction projects is cut off at the end of the year, and with the new year the story of financing begins all over. Complexities exist in the financing of capital construction as well. Here we have returned to rigid centralization: any construction project or reconstruction is planned down to the finest detail by the Gosplan. As for the fund for the development of production, it makes no difference to the enterprise whether it has this fund today or not since it is completely included in the centralized plan for capital construction. Not a single director can take advantage of it. We have jumped from one extreme, when this fund was not provided with capital investments, to the other--when we have practically eliminated it at the level of the enterprise.

In the Plans, With the Plans and About the Plans . . .

A. I. Buzhinskiy: It is time to speak about the quality of the plans. It seems to me that recently it has appreciably deteriorated. Of course, this is related to the fact that economic ties have become more complicated and the shortage of resources has worsened. Even if we were to find a better system of indicators, the quality of planning from above to below would not improve and we would not receive results.

O. M. Yun': We now plan basically the development of productive forces, that is, production capacities, output, deliveries and so forth. But the system of economic relations--production and financial--is established practically independently of the plan, although it is taken into account. Therefore sometimes the prices and financial levers stand in contradiction to the planned assignments. The 1979 decree was a step forward in this respect--in the five-year plan it is necessary to establish the system of economic normatives. Apparently this idea should be pursued to the end, and precisely: the entire system of production relations, just like the production volumes, should be established in the plan.

Prices should be developed and approved along with the assignments of the five-year plan. The same can be said about finances. It is necessary when developing the five-year plan to norm all the financial relations and to establish them in this plan. Unfortunately, now the balance of the country's financial resources envisioned by the decree only registers the financial disproportions in terms of those norms which are already in effect. So far it does not direct us toward revising the norms themselves (distribution of profit, payment for resources and so forth) or any of the basic financial relations.

The system of measures envisioned by the decree should be based on planning documents--methodological orders, instructions and provisions. When five-year plans are developed comprehensive programs are also developed, but they are not always coordinated in detail. Moreover, the plans do not provide for the priority of individual programs. The programs are approved and established, but the resources for their implementation have not been allotted in the necessary volume in the five-year plan. Because of this we have not managed

to conclude agreements for the construction of facilities envisioned by certain programs, and their creation has had to be put off until later dates.

P. G. Bunich: First of all it is necessary to change the sequence of planning and to changeover to economic regulators of the fulfillment of centralized assignments. This will make it possible to solve the problems of difficult plans, on which a good deal depends in a planned economy.

The draft of the plan should be drawn up from below. The results of the activity of the enterprise should be such that they are sufficient to cover expenditures on wages, investments and other kinds of expenditures. These results are calculated in the prices which reflect the social usefulness of the products that are produced. Then the enterprises that have proposed plans that are not difficult will punish themselves by obtaining poor results. And if they try to make up for what is lost by overfulfillment of the plan, this will not lead to decisive changes, for now not only production, but also sales are planned. Therefore it will be difficult to sell additional products. Nor is it easy to find an additional quantity of materials necessary for such an overfulfillment. It is precisely the plan that is necessary for prompt conclusion of agreements with construction workers, the selection, training and retraining of personnel, and so forth. In brief, stimulation of the result, of the level of effectiveness is related to the adoption by the collective of more difficult drafts of plans and leads to strengthening the planning basis.

In my opinion, the process of implementation of the plan of the enterprise should appear this way. From the actual earnings one must first subtract material expenditures, which leaves net output. From this output one should pay the wage rate (salary) according to the wage fund which is determined in the planning stage on the basis of optimization calculations and increased taxes on wages as compared to deductions for accumulation. The proportion of the wage rate (salary) in the final income of the worker should not exceed an average of 70-75 percent. The remaining income is needed for additional regulation of earning, the formation of the accumulation fund (for independent and centrally regulated investments), the withholding of state taxes and payment to higher economic levels, the creation of reserve funds, and payment of interest on loans.

If the draft of the plan for the enterprise coincides with the national economic approach, it is approved by the higher levels without changes. But when there arises, for example, the possibility of more efficiently assigning suppliers to consumers, the central agencies make the corresponding adjustments. The effect obtained this way goes in to the income of the society. Regulation of the drafts of plans retains the responsibility of the collectives for their results and at the same time provides for the necessary centralized adjustment.

EKO: In order for the collectives to be responsible for their results they must fully determine them and have greater rights than they have now. There arises the question: What specifically must be done to accomplish this?

P. G. Bunich: Rights depend on conditions. The concrete forms of today's technology of planning have taken shape under the conditions of a shortage of many kinds of products, the prevalence of extensive forms of development, the

inadequate qualifications of lower management personnel and other factors which have brought about a great expansion of the sphere of centrally established indicators. In the past, with a relatively low standard of living, earnings inclined toward equalization along the horizontal, and the number of workers at enterprises was relatively rigidly fixed.

When practically all of the essential parameters of the production activity of the collectives are established from above, the latter inadvertently become responsible not so much for the decisions that are made as for the fulfillment of centralized plans. Along with the evaluation of the collectives for the percentage of fulfillment of the plan, from below there has arisen an economic motivation to reduce the plan in terms of results and increase it in terms of expenditures. A less ambitious plan turned out to be less difficult, although the payment was such that it gave the advantage to those who were working less efficiently.

In order to overcome the desire of the collectives to adopt plans that were not difficult enough, the state developed a number of measures--planning "according to the base," stimulating the counterplan, and so forth, but they did not make any radical changes. Planning "according to the base" gave rise to a desire to lower the base level and not to overfulfill the plan by very much. Counterplans brought about a reduction of the basic plans. The incentive became greater, but the result remained the same. Planning and price legitimization of expenditures, in my opinion, is the main reason for the shortage.

Now the situation has changed. We are following a course toward intensification. This means that we leave more accumulations to the enterprises, stimulating their renovation and re-equipment. Economic ties have become more stable. There are trained personnel. Consequently, the time has come to give the collectives new rights, and at the same time to give them more responsibility for the results.

EKO: The question is more complicated. The responsibility for the results require that the prices reflect the results, but prices based on expenditures still prevail here.

P. G. Bunich: It is not without reason that I said that prices in which the result of the activity of the enterprise is calculated should reflect social usefulness. Their utilization, like the application of *khozraschet*, will contribute to improving planning. Prices based on expenditures appeared and served well in the system of incentives "for the plan," when the expenditure of resources was regulated not so much by prices, as administratively, when incentives depended more on developing the plan than on the prices with which it was drawn up. Subsequently the prices even stipulated the payment for capital and deductions into the incentive funds. When the branches were changed over to self-financing, the entire volume of monetary resources allotted to these branches was established ahead of time. The extreme case of such prices are calculated prices. In other words, the cost of the product was formed from the expenditures, but was not broken down into these expenditures. The profitability of both good and bad commodities inclined toward a single level. The longer the items were produced the higher that profitability turned out to be (until the next, extremely rare revision of prices). Thus outdated

prices became the most advantageous ones. The prices were more convenient, simple, conventional, passive-calculation forms than they were economic regulators.

The changeover to the principle of incentives for a high level of the plan requires the utilization of prices that reflect the effect achieved by the consumer from the application of this commodity. A considerable step in the direction of applying prices that are established within the limits of the effect of the products that are sold is the methodology for determining prices and net output normatives for new machines, devices, instruments and so forth. We have not only theoretical arguments, but also experience in providing incentives for a high level of the plan. This is the stimulation of enterprises of the Ministry of Agricultural Machine Building depending on the coefficient of shift work. Within the associations such methods are used at more than 100 enterprises of the Ministry of Chemical Machine Building and more than 100 enterprises in Sumy Oblast. The pioneer in these matters is the Sumy Machine Building Production Association imeni M. V. Frunze.

#### The Basis of Everything--Normatives

V. P. Moskalenko: Now the evaluation of work and material incentives at enterprises depend on the fulfillment of the plan. This forces us executives to look backwards all the time and maintain reserves. And those who utilize all of them can end up in a difficult situation: having reached certain limits, they breathe a sigh of relief, and they continue to work according to what has already been achieved!

In order for the system of economic levers to cause executives to take on more difficult plans, and, the main thing, to utilize reserves, it is necessary for the main criterion for the evaluation of the work and stimulation and the determination of the position in socialist competition to be the level of utilization of these reserves.

In our Sumy machine building association we have accumulated experience, the essence of which is that the evaluation and stimulation are arranged on normatives which determine the potential production capacities of the enterprise. In terms of all indicators (production volume, product quality, economy on resources, the technical level of production and the social development of the collective) normatives are developed which show what the subdivisions can do if they take advantage of the possibilities of scientific and technical progress. The number of these normatives for the subdivisions of the enterprise (shops and divisions) is about 60. In their economic essence they are maximum normatives (ceiling normatives of potential possibilities) and we establish the plans of the subdivisions in terms of the entire complex of indicators. The higher plans are given to shops which have achieved the least utilization of the capacities. This increases the substantiation of the planned assignments.

EKO: And how is the system of material incentives arranged then?



V. P. Moskalenko: You know that usually the bonuses for workers and engineering and technical personnel depend on the level of fulfillment of the plan, and not on the utilization of reserves or equipment. In our association the bonuses are calculated for the level of achievement of normatives. We base bonuses on that indicator which is necessary for the enterprise or shop in a given stage. For 5 years now we have been calculating bonuses for the level of achievement of normatives for product quality and the utilization of production capacities. Other enterprises can select other indicators. Our workers and engineering and technical personnel receive bonuses for the degree of utilization of their capacities under the condition of the fulfillment of the plan. Thus we try to stimulate adopting a more difficult plan.

EKO: Do you experience difficulties when working with such a unique system?

V. P. Moskalenko: Of course, it is not easy for us because it is as though we are on a little island: we ourselves evaluate the operation of the enterprise in the new way, but the ministry evaluates us in the old way. We receive a very difficult plan. But, in spite of this, for the past 2 five-year plans our quality indicators have been improving and the plan has been regularly fulfilled. And here is what is interesting. We have an economic methods center which is visited by delegations of scientific workers and production workers. We like our experience. But there are very few who wish to introduce it because they do not have the conditions for it. Methods have been developed for determining the difficulty of the plan, which have been approved by the Gosplan (our experience is also reflected in it). But, in the first place, nobody uses it and, in the second place, the principle of evaluation in terms of comparison with the normative level has not been extended to the formation of the incentive funds. As before, they are formed depending on the fulfillment of the five-year plan. But who evaluates the degree of utilization of reserves in the five-year plan itself?

G. A. Yegiazaryan: Your system is based on normatives. At the same time experience shows that normatives are our Achille's heel. How does one develop a good system of normatives?

V. P. Moskalenko: This task is not simple, but it can be resolved. This is shown particularly by our experience. The association has developed and introduced into practice methodological instructions for calculating normative levels of indicators and principles for applying them when evaluating and stimulating the results of labor and summing up the results of socialist competition. I think that if we work well, the system of normatives can be created not only for the enterprise and association, but also for the branch and subbranch.

In this connection, what should the passport of the enterprise be? Now this is a reference document of the type of the annual report, which includes the enterprise's report and planning data as of today. This document reflects only the existing situation, but does not answer the main question: What is the possible level of indicators and what are the reserves for all areas of the enterprise's activity. Without such data it is difficult to increase the substantiation of the plans, and the engineering and economic calculations will be based on the level that has been achieved.

One should take the normative approach when drawing up the passport. The maximum normatives we have suggested for all the most important areas of activity should be the economic essence of the passport. The existence of normative data in it does not completely eliminate planning from what has been achieved, but it may well make it possible to considerably reduce its influence.

R. A. Belousov: Planning and economic agencies and the accounting and control staff must improve their mastery of methods of analysis, substantiation and calculation of consolidated normatives for the expenditure of resources per unit of useful result. It is precisely in these normatives that the successes and shortcomings in our struggle for increasing the socio-economic return from the immense accumulated potential intersect and are manifested.

G. V. Zhuk: As of today the norms and normatives have not yet become an element of planning or the basis on which one can increase the economic incentives of the collectives. In my opinion, they can play this role only if they are long-term and their observance by all organizations is guaranteed. Frequently now it is not the plan that is developed on the basis of norms, but norms are established on the basis of the plan or available resources.

Take, for example, the normative of earnings per 1 ruble of output or the normatives for the formation of the incentive funds for the 11th Five-Year Plan. They were established in proportion to the number of workers: the fewer the workers the smaller the material incentive fund. In this case what enterprise would act to reduce the number of workers?! We say a good deal about the relationship between labor productivity and earnings, but as of today there are no normatives even consolidated ones, for increasing wages for each percentage point of increase in labor productivity. In our opinion, this sharply impedes the adoption of more difficult plans by the enterprises since they are not confident of obtaining increased earnings in keeping with the increase in labor productivity.

O. M. Yun': Strengthening the normative method of planning, apparently, is the central direction for improving planning. In the state plans for economic and social development it is necessary to changeover from assignments in terms of production volumes and allotted resources to the establishment of long-term economic normatives. In this case, when plans are drawn up at all levels of administration there is no motivation to reduce assignments in terms of production volumes or to increase them in terms of the volumes of necessary resources, and the funds of the enterprises and the incomes of the workers are made directly and obviously dependent on the final results of the work. Thus there can be proportionality in the development of the economy and the economic independence of the enterprises is strengthened. The main problem now is to substantiate and approve the necessary system of normatives, to inform the enterprises about them and to provide for their stability. Unfortunately one must note that the normative of earnings does not operate in the way we would like it to, even though it has already been established for approximately 20 ministries. When the plan is adjusted this normative is changed to accommodate the wage fund (both at the level of the ministry and at the level of the associations), and not vice versa. There is a marked striving to equalize and reinforce this fund at the level that has been reached. Normative distribution



of profit does not play the role for which it is intended either. Not one of the ministries that has applied this policy has informed its associations and enterprises about this normative. Moreover, the existing financial methods stand in contradiction to the normative method of distributing profit. The fact is that the USSR Ministry of Finance simultaneously envisions guaranteed payment from profit. These guaranteed payments into the budget are provided when the production plan is overfulfilled, but if it is not fulfilled the circulating capital is "eaten up" and the normative is no longer in effect.

Apparently it is time to restructure the relations between the state budget and the ministries and associations in keeping with the course toward intensification. With extensive development all means have been accumulated in the budget, and from this centralized source they have been distributed for construction, development of the production sphere, and so forth. Now, when we are changing over to the intensive path of development, normative distribution of profit, the normative of the wage fund, fixed payments and relations with the budget should correspond more precisely to the planned economic relations and should create motivation for effective work.

What Should the Association Be Like?

G. A. Yegiazaryan: The effectiveness of the economic mechanism, in my opinion, depends largely on the organizational structure on which it is based. With the adoption of the July (1979) decree, it was necessary also to solve the problem of the organizational structure. In the 1970's we developed general plans for administration of the branches, but the restructuring of administration is still far from completion.

R. A. Belousov: It seems to me that the structural designs developed in the middle of the 1970's are now obsolete. For the conditions of the 1980's and 1990's, in my opinion, we need associations that are larger than the present ones. They must take a new step in the direction of specialization, concentration and renovation of production, and combine it with science. To do this each association must have a large scientific research and design subdivision, and also one or two experimental plants. That is, in the future each association should be a scientific production association to a greater or lesser degree.

O. V. Fedorov: Our ministry of the electrical equipment industry in 1975 was changed over to administration with 3-level (ministry--scientific production association--production association, enterprise) and 2-level (ministry--production association, enterprise) systems. Then the middle unit--the all-union production association--was given extensive rights. The number of controlled objects was reduced as was the administrative staff. When changing over to the new system of administration the ministry worked to consolidate the functional channels of administration, provisions concerning structural subdivisions of the central staff were revised and approved, and functional duties were clarified.

The goal of the restructuring consists in transferring the functions of operational administration of production to the middle level--the all-union production associations. The central staff had to direct efforts toward resolving

problems of long-range development of the branch. As a result, a new level of administration was reorganized--the central staff of the ministry, and a second level was created, which consists of 16 all-union production associations. But the legal status and the economic rights of the all-union production association do not coincide. For this reason the functions of the all-union production association are duplicated both at the higher level of administration and at the lower one. The central staff of the administration has not transferred its functions to the middle level--the all-union production association. Therefore, it seems to me, it is necessary to have a more efficient redistribution of the functions of administration between the central staff and the all-union production association, and to bring their production and economic interrelations into line with the provisions concerning the all-union production association.

Many questions also arise at the level of administration of the production association, especially in connection with the organization of new associations.

A. I. Buzhinskiy: Yes, it is necessary to take a more thoughtful approach to new production associations. It is not expedient to join enterprises together artificially, when they do not have technical production ties. Sooner or later such an association will have to be eliminated. It seems to me that an association which includes enterprises with the rights of production units has a number of advantages over those whose enterprises are on independent books and have the rights of a socialist production enterprise. But in practice the association is no longer a unit of one-man management or a fully authorized manager, since the ministry plans the assignments for the plants individually. Our ZIL association belongs to the first type. The ministry enters in to relations not with the plants, but with the association as a whole, and it also keeps accounts with the budget. Experience has shown the progressiveness of this form.

V. P. Moskalenko: I agree with Aleksandr Ivanovich. Production associations should be created as a unified production and technical complex, and not as an arithmetic variable of enterprises, each of which maintains independent books, an account in the state bank, a board of directors and so forth.

Our Sumy association was formed on the basis of three independent machine building enterprises that belong to various subbranches of the Ministry of Chemical Machine Building. It has a unified general board of directors, a single bank account and one set of books. The enterprises have been transformed into productions and the administration of the association has been centralized, which has made it possible to simplify the structure of administration, to consolidate auxiliary services, and to utilize all the advantages of specialization in basic and procurement productions. The assimilation of introduced capacities has now been considerably accelerated, and state assignments for producing the most important products for the fuel and energy complex are fulfilled on time and well--gas pumping equipment, main circulation pumps and pumps of contour II for atomic electric power stations.

O. V. Fedorov: One must say that in our branch too--the electrical equipment industry--with the creation of production associations the provisions concerning the production association were sometimes violated. The production units included in the association were deprived of the rights of a legal corporate

body for various reasons. Subsequently this process became stronger. While in 1976 more than 70 percent of the production units were deprived of this right, in 1982--only about 30 percent. Moreover, during the past 5 years enterprises that were operating well left certain associations because when they were working as part of the association their production and economic indicators deteriorated.

EKO: What, in your opinion, is the main shortcoming of administration at the level of production associations and what are the possible directions for improving it?

O. V. Fedorov: There is no approach to the development of associations as a unified production and economic complex. We have still not surmounted the tendency to control production associations with the same methods as we use for enterprises. There is no clear-cut differentiation of administrative functions between the staff of the head production unit and the administrative units of the organizations under its jurisdiction, particularly those that have retained their independence. We have not found an effective subordination between functional units of administration, and a smaller role is assigned to the association council which is called upon to combine the interests of the association as a whole and its subdivisions. A number of associations did not have a sufficient degree of centralization of administrative functions and did not join auxiliary and service subdivisions together. This did not contribute to transforming the associations into unified production and economic complexes. In my opinion, an effective measure would be to clarify the provisions concerning the production association.

In our branch 2 years were spent on obtaining permission to be guided by the constructions concerning the composition, the policy for development and the approval of the technical and economic substantiations for the development of the association as a unified production and economic complex. New instructions were approved concerning the policy for technical re-equipment of existing production and scientific production associations.

G. A. Yegiazaryan: Can the director of an association make changes in the structure of the administration of his own association?

O. V. Fedorov: In the provisions themselves concerning the production association there is a contradiction: in one case it says that the general director approves the structure of the association with respect to the type, and in another--that the structure should constantly be improved. As a result, today the director can make no changes.

EKO: In your opinion, what role can be played by computer equipment and automated control systems in improving the administration of the branch and the production association?

O. V. Fedorov: Further increasing the effectiveness of the utilization of computer equipment and automated control systems is impossible without a radical rearrangement of the organizational structures and the technology for

administration of associations and enterprises. In keeping with the decree of the USSR State Committee for Science and Technology, the electrical equipment industry is conducting an experiment for creating effective new structures of administration of associations and enterprises under the conditions of the functioning of automated control systems. The base enterprises for conducting the experiment are the Berdyansk Azovkabel' plant, the Saransk Svetotekhnika production association, the Minsk electrical equipment plant imeni V. I. Kozlov, and the Novocherkassk electric locomotive construction plant.

The goal of the experiment is to improve the quality of administration of the enterprise on the basis of the utilization of computer equipment and increased effectiveness of automated control systems. This goal is achieved through the creation of new and the reorganization of existing subdivisions of the administrative staff, the redistribution of functions, the elimination of duplication of work, and also a change in the composition and job duties of administrative personnel.

But various types of directive documents of the USSR Ministry of Finance and the State Committee for Labor and Wages make it impossible to change the structure of administration or to introduce new positions or titles of divisions. And this is effective. In 4 enterprises alone an actual savings of more than 2 million rubles was achieved, including from releasing personnel--400,000 rubles. By a decision of the board of the ministry the experiment was extended to 12 more enterprises and associations.

The ministry has approved a program for the development of automated control systems for the five-year plan. In order to assimilate electronic computers the associations and enterprises need allocation for maintaining administrative and management personnel (AUP). But these allocations are not being provided. Yet it is clear that the introduction of electronic computers does not immediately release AUP. Computer equipment must first be assimilated and only after this is it possible to release people. But how does one introduce electronic computers if not a single person is assigned for this? Moreover, the personnel employed in the introduction of automated control systems and electronic computers are included in the category of AUP. Is this expedient?

The branch has begun to create centers for collective utilization (KVTs). Three have already been introduced--in Estonia, Moldavia and Latvia. But we stopped here. It turns out that nobody knows which legal form of organization can include them--industry or science. What are their products and how does one introduce indicators for the main activity? We have calculated that 24 centers for collective utilization which can and should be created under the 11th and 12th Five-Year Plans will make it possible to reduce recruitments into this sphere by approximately 5,000 people. In my opinion, the figure is significant and it forces us to think about which is more advantageous: to have provisions about the KVTs or to leave everything as it is.

#### The Scientific Production Association in the System of Administration

EKO: The stronger mutual organizational and economic ties between science and production are a requirement of the time. The key significance of scientific

and technical progress was also discussed in the speech by the General Secretary of the CPSU Central Committee, Yu. V. Andropov at the November (1982) Plenum of the CPSU Central Committee. In this connection I should like to discuss a new form of introduction of science into production which has arisen in the national economy and is successfully operating--scientific production associations. There are about 250 of them in all the branches. What is their role in administration and what problems arise here?

Yu. I. Yushakov: The principle of the organizational structure of the scientific production association is unified: it is headed by a scientific research, design or technological institute which has jurisdiction over experimental plants that are included in the scientific production association with the rights of structural units. Only the scientific production association as a whole has legal independence. This type of association is called classical. The Ministry of Heavy and Transport Machine Building conducted an experiment, including in the Sverdlovsk scientific production association of mining machine building, which was created in 1977, 4 independent plants for series production that operate with the rights of socialist enterprises, 2 institutes and 2 experimental plants that are located in 3 oblasts of the Ural economic region. The latter do not have legal independence and operate on the basis of provisions that are approved by the association.

The following form of administration has arisen in our scientific production association and has been operating successfully for 5 years: the scientific research institute plans, operationally administrates and exercises control and regulation of all kinds of activity in the area of science, production, construction and so forth. I am deeply convinced that this form of administration will prevail in the future. It seems to me that scientific production associations that consist only of institutes and experimental production, without series production plants, will not solve the problem of the unity of science and production. Regardless of how significant the results of scientific activity may be, without prompt and extensive practical introduction of them and the startup of series production of new items, they will not produce a great effect.

EKO: What other arguments in favor of the scientific production association are produced by your own experience?

Yu. I. Yushkov: The scientific production association forms the strategy of the subbranch for the areas assigned to it, creates favorable conditions for comprehensive planning of scientific and production activity and efficient utilization of personnel, and provides for long-range development of scientific research.

This form of organization makes it possible to eliminate the organizational separation with the creation and assimilation of new technical equipment, and considerably reduces the process of "research--production." Thus in our association this cycle has been reduced to two-thirds-one-half the former amount. Carrying out these processes in parallel makes it possible to exercise stage-by-stage control over the course of developments. Scientific subdivisions and experimental and series productions operate jointly both in the initial stage of scientific research and in all of the subsequent stages. As a result, the

proportion of new technical equipment in the overall volume of products produced by the enterprises increased from 3.1 percent in 1976 to 22.5 percent in 1982.

Under the conditions of the scientific production association one achieves all-around responsibility on the part of the workers and there are no intermediate units. The level of developments rises considerably because they take into account the technological peculiarities of the specific production. This reduces to a minimum the need to adjust technical documentation. The scientific production association is transformed into the organizer of scientific and technical progress since the association adheres to a unified all-around technical policy. This makes it possible to "rejuvenate" plants that are technically backward. It is also important that within the framework of the association it is possible to predict reliably the directions of scientific and technical progress.

Services for information, scientific organization of labor, personnel training, patent and license work, normalization, standardization and unification, prognostication and study of the demand for products, the development of material and labor normatives, a powerful technological service and so forth are well developed in the head organization of the association. It is precisely these services that are poorly developed at the plants, especially small ones. All these functions are taken on by the head organization of the scientific production association. As experience shows, conditions are created in the scientific production association for improving the socio-psychological climate in the collectives of scientific workers, and people sense their significance since they see how they results of their labor are embodied in products.

If specialization of the association is correctly determined and there is proportionality among the capacities of science and production, one no longer has to deal with the age-old problem of the scientific research institute--work that does not have immediate application. I think that there are enough arguments in favor of giving scientific production associations the predominant position in the country's industry.

O. V. Fedorov: It seems to me that there are still quite a few problems in this area. I refer, for example, to our ministry of the electrical equipment industry. We have now created 72 production associations and 4 scientific production associations. Why in such a science-intensive branch as electrical equipment are there only 4 scientific production associations? The fact is that centralized planning of the activity of the scientific production association is limited to the existence of separate funds and differences in the systems of planning and financing science and production, which impede the integration of planning and accounting work and the formation of a unified plan and unified accountability for the scientific production association.

Yu. I. Yushkov: Indeed, there are many questions that arise in connection with the creation of scientific production associations. And one of the main ones is the development of all-encompassing indicators that coordinate the activity of scientific research subdivisions, experimental plants and series



production, which provide for direction toward the final result. In this connection it is justifiably demanded that unified planning assignments be established for the association as a whole. But up to the present time the planning of scientific and industrial activity is done separately. It is necessary to permit the associations, perhaps as an experiment, to redistribute within reasonable limits the number of personnel and the wage fund between industrial and scientific activity. This will make it possible to solve many problems, including to centralize administration of subdivisions of the scientific production association. But so far planning, financing and evaluating the activity of scientific-technical and production subdivisions are done separately. Problems of material incentives for scientific workers which strengthen their motivation to raise the technical level of the enterprise have not been resolved yet either.

It is impossible to enumerate all the problems: they include expanding the rights of the associations, increasing their responsibility, further developing autonomous financing and creating unified economic incentive funds. There is now a need for the USSR State Committee for Science and Technology to generalize the work experience of the country's scientific production associations, to hold a unionwide conference or meeting and develop recommendations which would make changes in the existing provisions concerning the scientific production association.

We have no high-level agency which can engage in problems of organizing control of production on the scale of the country. So we are creating the scientific production association, a new form of organization. But who is interested in this and who will continue what has been started?

Rejoinder: The USSR State Committee for Science and Technology.

Yu. I. Yushkov: But who there is specifically dealing with these problems? I would like for one agency to generalize the experience of scientific production associations and make it clear since a lack of clarity in this issue is very costly to the country.

L. I. Abalkin: From the standpoint of the general director of a scientific production association, tell us which planning indicators should be established for this type of association?

Yu. I. Yushkov: I am convinced that the indicators should be the same for scientific production activity. In my opinion, it is necessary to plan the list of scientific and industrial products, the wage fund and the profit.

O. V. Fedorov: I should like to support Yuriy Ivanovich in the question of the need for a special high-level agency that deals with problems of administration. Even in the 2nd Five-Year Plan, as part of the state plan for economic and social development of the USSR national economy, there is a section for improving administration which is very important and necessary. It makes it possible to determine the economic effect from the implementation of measures in this area and to carry them out in a planned way. But up to this point neither within the ministries nor among them is there a single intercoordinated system of agencies that performs the all-around function of improving administration.

Improvement of administration is handled by centers for scientific organization of labor, divisions of automated control systems and laboratories for economic analysis. The communications among these subdivisions both along the horizontal and along the vertical are not regulated and are sometimes random. In certain branches of administration the automated control systems are created under the central staff, in others there are independent divisions, and in still others there are divisions that are included as part of the planning-economic, financial and other administrations, and in certain ministries they do not exist at all. Some engage only in automated control systems, others in improvement of administration, and still others--both. There are no general branch recommendations regarding this issue.

#### Both Centralization and Independence

L. I. Abalkin: Another important direction for improving the economic mechanism is further democratization of administration and the formation of a feeling in the workers of being production masters. A whole complex of problems will have to be solved here.

True, many problems in this sphere were removed after the enactment of the law concerning labor collectives. It is difficult to overestimate the significance of this document. Without making exceptions, we should be guided by the principle: the person who makes a decision is responsible for the results that are received. Without this it is impossible to form in the workers an active feeling of being the master with its indispensable attributes--thriftiness, cautiousness and a love of work--and to achieve a radical improvement in discipline.

Of no less importance are such areas of democratization of administration as extensive publicity when discussing and adopting economic decisions, accountability of planning and economic agencies to the masses, and a real guarantee of the rights and independence of lower administrative units, production associations and enterprises.

P. G. Bunich: But in order for a person to feel that he is a master, he must be one. And for this it is of primary importance to activate autonomous financing. If the collective is responsible for the results and depends on them, each worker is motivated to reveal reserves and not conceal them. Enterprisingness and initiative develop, and there are stronger stimuli for scientific and technical progress and improvement of the quality of the items. With such a system the enterprises will search for orders and not avoid them, will conduct specialization and not naturalize the business. There will be greater flexibility of administration and the changeover to effective organizational structures will be provided not only from above, but also from below.

V. P. Serikov: The individual plays the major role in solving any production problem. Regardless of what problems may be discussed at the upper levels of administration, the success or failure of solving them is determined from below. Our workers have a good understanding of the problems of the economic mechanism. They are well aware what it is to plan "from what has been achieved," what the utilization of gross indicators leads to, and they are aware of the merits and shortcomings of various forms of labor organization, for example, the brigade contract.



What is important in the brigade contract? It is necessary for the members of the brigade to have a specific task, for them to be given all the necessary information for the job, and for them to know the sum of money they will receive for a large volume of work or for a certain object. In my opinion, the motivation for the brigade contract increases if the brigade is paid precisely for a large volume of work or, best of all, for a particular object.

It is very easy to create a brigade on paper. You take 20 people, sit down at a table and explain: you are a brigade. But in reality creating a brigade takes a long time and hard work, and it remains if its members are put in conditions whereby they can be responsible for the results of their labor. People begin to feel both their significance and their responsibility.

I am in favor of orienting the work of the brigade toward the final output so that there are no isolated jobs. This is advantageous both to the workers and to the state. I shall give an example from my own practice. It was necessary to perform work for releasing prepared objects worth a sum of 4 million rubles. Four brigades were created. Thus when the brigade leaders accepted the objects, each brigade was given a million rubles. I had a brigade with 65-70 people, and the other brigade leaders had brigades of approximately the same size. And 126 people turned out to be too many! But before this the chiefs of the administrations explained all the failures in the operation and release of facilities by the shortage of people. The situation was repeated the next year--50 people too many! It turns out that when the organization of work is intelligent and efficient, there is no shortage of labor resources.

In trips throughout the country one frequently sees that people are working separately, in small brigades, there are no contacts between them, they frequently overlap in the subsequent course of the work, and it turns out that the administrative foremen frequently keep a considerable proportion of the workers in reserve. When it is time to release the object, they throw all forces into it. But with the brigade contract the release of an industrial object begins actually with the first day of work on it because the brigade is motivated to reduce the time periods and prepares for this ahead of time. It is no accident that they say that with an intelligent brigade the work is half done.

G. A. Yegiazaryan: How do you evaluate the destiny and future of the brigade contract?

V. P. Serikov: Life has shown that good realization is no less important than a good idea. Our problem is that we boldly set tasks, but we do not carry them out very skillfully. Of course, we have individual brigades that are created in the way that is suggested by the idea of the brigade contract. But there are not many of them. Mainly people continue to work as they would if there were no brigade contract. We could obtain a much greater effect from this method of organization, measured not in conventional, but in real savings, if we correctly approached the organization of brigades and the development of a system of paying for their labor. I think that having gone through the growth pains, the brigade contract will still occupy a worthy position.

V. P. Moskalenko: This idea is quite true. At certain plants they create brigades which exist only on paper, while in fact the orders are filled out and the payments are made to each person individually. A good deal depends on how we carry this out. If the matter is arranged properly, the advantages of the brigade contract will be invaluable.

O. M. Yun': Vladislav Pakhomovich has correctly pointed out that the worker in a modern enterprise has a fairly good understanding of questions of the economic mechanism. Let me add that in terms of his educational level he is close to the engineering and technical personnel and is becoming a bearer of technical, economic and social progress. Why do they speak of the effect of the brigade? Primarily because the brigade itself is in charge of the means of production, the relations among members of the brigade and the result that is achieved.

A. G. Aganbegyan: We have considered a broad group of problems related to improving the economic mechanism. There is no doubt that we have touched on far from all of the important aspects of this subject. And this can hardly be done in one discussion.

If the questions we have considered today are regarded from more general positions, two groups of interconnected problems appear. The first is related to strengthening the centralized basis in the management of our country's economy. We discussed the increased role of the national economic plan, improvement of its quality, and provision of balance and correct distribution of centralized reserves. All these measures are directed toward overcoming exclusively departmental and local interests and strengthening the statewide national economic approach to the system of administration. In close connection with this is the second group of problems. These are problems of expanding the independence of the associations and enterprises and their rights, with a simultaneous increase in their responsibility. I think that all of us were greatly satisfied to receive the instructions given at the November (1982) Plenum of the Party Central Committee to the effect that the time has come to take a practical approach to solving the problem of expanding the independence of the associations and enterprises.

The most difficult thing, apparently, will be to organically combine increasing national economic centralization and strict observance of statewide interests with the increasingly greater independence of lower economic units, all-around democratization of administration and the enlistment of the broad masses of workers to participate in administration.

Our country and other socialist countries have accumulated a good deal of experience in applying various systems of planning and material incentives. We have now set the task of finding concrete solutions to the crucial problems in the development of the national economy, and, as the General Secretary of the CPSU Central Committee, Yu. V. Andropov pointed out at the November Plenum of the Party Central Committee, we must find them "by generalizing domestic and world experience and interpreting the knowledge of the best practical workers and scientists." One hopes that our round-table discussion will be contribution

--of course, an extremely modest one--to solving these problems which are vitally important to our country.

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## PROs, CONs OF DECENTRALIZED INDUSTRIAL ADMINISTRATION EXAMINED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA  
in Russian No 8, Aug 83 (Signed to press 13 Jul 1983) pp 50-69

[Article by R. G. Karagedov, doctor of economic sciences, professor,  
Institute of Economics and Organization of Industrial Production of the  
Siberian Branch of the USSR Academy of Sciences (Novosibirsk): "On the  
Organizational Structure of the Administration of Production"]

[Text] The organizational structure serves as a basic element of the administrative mechanism and reflects the overall logic of its structure. By determining one or another division of the functions among various units of the system of administration, their position, authority and responsibility, it thus creates organizational conditions for realizing the methods of administration adopted in the given system. The overall design of administration and its organizational structure are thus closely related and mutually conditioned. And, obviously, one can distinguish two directions for improvement of the organizational structure of administration: bringing it increasingly in line with the existing overall design of administration and restructuring it in relation to the development and changes in this design itself.

The organizational structure of the administration of industry in the USSR took form, in its principle outlines, at the beginning of the 1930's. Its emergence took place under the specific conditions of the economy of the transitional period, when we were solving problems of creating a basis for domestic industry and providing for the economic independence and defense capability of the first socialist state in the world. The necessary forms of organization of the administration were not found immediately. The People's Commissariat of Trade and Industry, the Supreme Council of the National Economy with its network of local councils of the national economy, the trusts and main boards of the period of military communism, the autonomously financed trusts and associations during the years of the NEP, the syndicates and associations and, finally, the people's commissariats and main boards (1931-1932), and the branch ministries and production associations in the post war period--these are the main landmarks of the development of the structure of soviet industrial administration.

The hierarchical structure of administration, which relies on branch agencies, was formed, in the final analysis, under the influence of the tendency toward centralization of the management of the national economy, which predetermined the main peculiarities of the new type of economic mechanism. The possibility of such centralization, as we know, was opened up by public ownership of the means of production, and its advantages were confirmed by the entire practice of the country's industrial development. Under the conditions of precisely these organizational forms, remarkable victories were won in economic construction--during the years of socialist industrialization, the prewar five-year plans, the Great Patriotic War and the postwar period, victories which placed the USSR among the leading industrial powers of the world.

The branch principle of administration is the distinguishing feature of the system of management of our industry throughout practically all of its history. Its merits include, above all, the orientation toward fuller satisfaction of the public demand for products of the branch and the possibility of conducting a unified technical policy within its framework. The traditional adherence to this principle is also explained by the fact that it combines well with methods of planning and administration that prevailed during the period of the extensive growth of industry. Because of this combination the advantages of branch administration were also manifested during the course of this period, and this fully explains the continuing desire to utilize it in the future.

But life is constantly making adjustments to our plan. The country's entry into the stream of primarily intensive development of production sets new tasks for the system of economic management, including with respect to the structure of administration. The 26th CPSU Congress said that the main reason for the shortcomings and difficulties in the development of the soviet economy was the "force of inertia, tradition and custom that had arisen during that period when not so much the qualitative as the quantitative side of the matter came to the fore." "One should note in general," it was emphasized in the accountability report of the party's central committee to the Congress, "That improvement of the organizational structures of administration does not tolerate stagnation. One cannot adapt a living, developing organism of administration of the economy to stagnant, customary forms. On the contrary, the forms must be brought into line with the changing economic tasks."\*

The organizational forms of administration of industry, which are oriented toward the branch approach, no longer fully correspond to the changing conditions of its development. It is reasonably noted in scientific literature that the patterns of change in technical equipment and technology

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\*"Materialy XXVI s"yezda KPSS" [Materials of the 26th CPSU Congress], Moscow, 1981, pp 37, 51

of production under the conditions of the scientific and technical revolution, the increasing significance of interbranch cooperation because of the development of division of labor, and other objective processes sharply reduce the capabilities of an individual branch to solve national economic problems. "As a result, two major tasks, which especially insistently required a branch approach--providing for satisfaction of the public demand and acceleration of scientific and technical progress--now require more and more an interbranch approach and are less and less able to be solved through the forces of an individual branch."\* One cannot but agree with the idea that, because of the aforementioned objective factors, industrial ministries are increasingly ceasing to be state agencies of economic management which adhere to a long-range scientific and technical policy, and are becoming agencies for operational control of the current activity of the enterprises. Serious problems arise because of the organizational separation of the branches of industry. The periodical press is filled with examples of losses and missed opportunities which are the direct result of the divergence of interest of the branch ministries and the lack of the necessary coordination of their work.

In this situation it is insistently necessary to search for new organizational forms that are capable of more fully utilizing the cardinal advantages of planned management--the possibilities of centralizing strategic decisions and providing for unconditional priority of national economic interests. Of course, new requirements are now being placed not only on the organizational structure of administration, but on practically all units of the economic mechanism. But this does not diminish the significance of a special analysis of those problems which are conditioned or aggravated mainly by the existing structure of administration. It is important only to keep in mind that the recommendations for improving it should take into account the need for the corresponding changes that involve other elements of the system of administration as well.

#### Branch Administration of Industry and the Industrial Policy

Branch administration is essentially (in any case, mainly) administration "according to the products." It coordinates well with planning of volumes of production in physical indicators and distribution of the corresponding assignments of the plan among those who execute it. Consistent adherence to this principle of administration presupposes singling out "pure branches" and separating them organizationally. Thus with the constant complication of the structure of modern industrial production and the expanding list of products of its branches, there should also be a constant increase in the number of branch administrative agencies. This tendency, incidentally, is also stimulated by a simple increase in the volumes of production and the number of enterprises in the branch--in this case it is dictated, obviously, by considerations of its controllability.

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\*Popov, G., "The Development of Branch Administration of Industry,"  
KOMMUNIST, 1982, No 18, p 53

While in 1939 in USSR industry there were 76 economic branches, by 1971 there were 162 of them, and the further increase of their numbers is predictable. There is a corresponding increase in the number of agencies of branch administration. In 1932 three industrial people's commissariats were created, and by 1941 their number had increased to 25. In the postwar period the process of breaking down branch agencies for administration of industry is continuing: in 1946 there were 31 industrial ministries, in 1970--32, and in 1980--36. This tendency can be clearly traced in machine building: from one people's commissariat of machine building (1937-1939) by 1954 seven machine building ministries were formed, by 1957 there were nine of them, and in 1980--12.

The continuously increasing number of branch administrative agencies means a growing number of centers for making decisions about the development of industry. The coordination of their activity is becoming an increasingly complicated matter. The differences of economic interests of various branches of industry are obvious, and they become stronger because of the limitation of many kinds of resources for social industrial purposes. But with the organizational separation of the branches these differences are a source of collisions which appreciably complicate the tasks of centralized management. They give rise to the so-called "departmental separation" which is provoked and stimulated by tendencies towards self-sufficiency. The striving toward primary growth of "one's own" branch and its self-provision with resources under these conditions is natural, but it stands in contradiction to the interests of comprehensive development of industry. Organizational separation of the branches seriously impedes interbranch cooperation and this is perhaps manifested to the greatest degree in such an important area of work as the introduction of scientific and technical achievements into production. New technical ideas which are of interbranch significance frequently do not find a specific organization to use them and be responsible for their practical implementation. The introduction of new technical equipment is also impeded in the increasingly typical case where joint efforts of various branches are required. All this is a serious cause of the inadequate rates of technical progress in industry. It takes five-six years to proceed from the formulation of a scientific theme to the adoption of a decision concerning the output of a new kind of technical equipment, and seven-eight years until the product is manufactured in series.

These unfavorable tendencies can be mitigated (and actually are being mitigated) by central planning and economic agencies, but obviously they cannot be completely eliminated with the present organizational forms of management of industry. The organizational structure of administration exerts an essential influence on the motivation of managers, and thus on the nature of the decisions they make. But with the existing structure of administration, decisions of branch agencies which diverge from the interests of comprehensive development and, in the final analysis, impede the implementation of the state industrial policy are also frequently motivated.



Our economic literature does not devote the proper attention to the concept of the economic policy, which was extremely widespread in the past and, it seems to us, has not lost its significance even today. The state industrial policy is a constituent part of the general economic policy and its independence, of course, is relative. But with all the closeness of the ties among individual areas of the economic policy there are always boundaries between them which explain the need for singling out concrete goals and tasks in each area. This is why, actually, we have a separation of the concepts of the industrial policy and the agrarian, financial, foreign economic and so forth. The industrial policy is necessary primarily in order to determine the priorities of the tasks set for industry during a given planning period, and the correct proportions in the development of its various branches--this is possible only from the standpoint of an overall concept of the development of industry. It is also necessary from the institutional standpoint: the delimitation of various areas of the economic policy is an important condition for its successful implementation in each of them, which requires special knowledge and qualifications. And, of course, the Hungarian economist, Z. Roman, is right when he considers arguments in favor of a clear-cut formulation of the industrial policy of the socialist state to be weightier than the danger regarding the possible loss of the unity of the economic policy this way.

In the USSR, of course, there is a quite definite industrial policy whose concept is formulated on the basis of the decisions of the Communist Party--as a part of its economic strategy--and is reflected in the long-range plans for the country's economic and social development. But the function of determining the industrial policy, like the administration of all industry, is not organizationally separated--it is carried out by central planning and economic agencies that simultaneously also perform important functions in management of the national economy. The activity of the industry as a whole at the present time is embraced--from various sides--only by central functional agencies, and there is no corresponding linear unit of administration. The industrial policy is implemented by dozens of independent branch ministries that also influence the process of its formation, and the course of its implementation even more. Therefore, the interests of individual branches of industry frequently turn out to be hypertrophied--to the detriment of the interests of its comprehensive development. With the increase in the number of branch administrative agencies, the task of providing for unity and a comprehensive nature of the industrial policy becomes increasingly difficult.

#### The Departmental Principle and the Hierarchical Structure of Administration

In actual economic practice the processes of branch specialization are usually interwoven with the diversification (multifacetedness) of production.

But under various organizational and economic conditions, diversification assumes various forms and renders different kinds of influence on the final effectiveness of production. In those cases when it does not harmoniously augment specialization but stands in contradiction to its interests, the losses of expenditures of public labor are obvious. This is the situation, for example, at enterprises of the so-called "universal type" with a closed production cycle for specific objects--which is extremely widespread in our industry; such are the consequences of the "overgrowth" of branch ministries (and not only industrial ones) which have everything they need, but these things are not included in their production profile.

The inefficient forms of diversification of production in industry are explained to a considerable degree by the organizational separation of the branches. This leads to a dispersion of interbranch productions and brings about a low level of specialization; the production of many items for the same purpose is divided up among many enterprises. The proportion of products that are not in the profiles of industrial ministries constitutes about one-fifth of the overall output, and for certain ministries this proportion is much greater. The proportion of specialized ministries in the overall volume of production, for example, of forging and pressing machines is 67 percent, instruments and means of automation--57 percent, cargo cars--64 percent, sulfuric acid--56 percent, brick--62 percent, items made of wood--59 percent and items made of plastic 32 percent. Timber materials are produced in the country by enterprises that belong to more than 70 ministries and departments and construction materials--60. And in industry as a whole the proportion of products outside the profiles of the ministries has a tendency toward increasing.

The organizational separation of the branches of industry serves as a serious reason for the slow reduction of inefficient and superfluous long-distance and returned shipments: the enterprises are loaded, naturally, primarily with products of interbranch cooperation. Thus there are plants for producing reinforced concrete items in each oblast, and nonetheless 23,000,000 tons of these products are shipped over long distances annually. The Sverdlovsk railroad sends prefabricated structures to all corners of the country (2,500 carloads a month) and receives products from all regions (3,500 carloads).

The formation of nonprofile productions within the industrial ministries and a kind of naturalization of their economy stands in contradiction to the very principle of branch administration. The latter is gradually being transformed into departmental administration, as a result of which one forfeits the merits of the branch principle and the factor of departmental separation assumes full force. Since "pure" branches are coinciding less and less with economic ones, there is a corresponding reduction of the possibilities of a clear-cut division in the structure of the administration of the unit that bears responsibility for the condition and development of the branch. The differences in the economic interests of the various branches of industry lead to a divergence of the interests of departmental units, which are far from the same thing. And the main thing is

that diversification of production in the branch ministries frequently assumes a compulsory nature; it is now dictated not by considerations of the final national economic effectiveness and not even the interest of the branch as such, but by these same departmental interests. It is calculated not for flexible adaptation to changing economic market conditions, but toward self-supply of resources for the businesses under the jurisdiction of the department at any price. And this price turns out to be a low level of specialization of nonprofile productions and, correspondingly, low economic indicators for them.

The dispersion of industry among various departments leaves the imprint of economic regions of the country on the production structure. It gives rise to parallelism and duplication of the same productions within the framework of the regions. The very system of ministry administration has the possibility of an inefficient structure for the economy of the regions: the existence of many "masters" on a given territory is combined with the lack of their responsibility for developing interbranch productions that are common for the entire complex. The interests of the branch departments and regions differ a great deal. For the former there is a natural striving to economize on expenditures on the production and social infrastructure, which increases the estimated cost of the production capital that is being constructed and reduces its return. The same thing explains the desire to make investments in inhabited regions that are provided with a labor force, roads, social and cultural facilities and so forth. But here they do not always take into account the interest of the economic region as a whole: intelligent cooperation among enterprises of various departments that are located on the territory, measures for protection and reproduction of the environment and so forth. The interests of the territorial agencies are concentrated, on the contrary, on interbranch and infrastructural questions, but their justifiable demands on branch departments cannot always be satisfied--because the latter has a shortage of the corresponding special-purpose resources. The divergence of branch and regional interests seriously impedes the solutions to the problems of comprehensive assimilation of natural resources and complete utilization of raw and processed materials.

In the industrial ministries themselves administration is carried out according to a multilevel structure, and all the peculiarities of hierarchical structures are inherent in it. In combination with the existing policy for approving the numerous compulsory assignments of the plan, this structure--irrespective of the number of administrative units along the vertical--brings about rigid centralization of economic decisions in branch departments. As a result there is a distance between the place of decision making and the source of information, which frequently deprives them of flexibility and timeliness. Here the consequences of the not unknown tendency toward drawing up "cautious" plans are multiplied in keeping with the number of levels through which the draft of the plan must pass. Direct contacts among enterprises of various branches and operational coordination

of decisions, which is so necessary in the interest of interbranch cooperation, especially for the acceleration of scientific and technical progress, are impeded because of the complicated procedure for approving the majority of decisions at higher levels of a branch administration. For in each branch department the draft of the decision must go through all units of the administrative structure from bottom to top, and the approved decision must go in the reverse direction. The limitation of the rights of the primary production units in the final analysis is also a limitation of their responsibilities.

With a system of administration that has many units along the vertical, the task of providing efficient forms of communication is also more complicated. The length of the communication chain is increased, and therefore there is an increased probability of distortion of information and outlays related to transmitting it. Since the concrete goals of various structural levels of administration are different and sometimes opposed, feedback is impeded and the most important requirement of the bilateral nature of communication is violated. In the central press one encounters articles about cases where the higher administrative units do not adequately inform the lower ones, concealing evidence which could threaten their authority. The latter, in turn, try to submit to the higher agencies information that is embellished and shows them in the best light, and they cover up mistakes and unsolved problems (the well-known practice of artificially increasing figures on reports, and so forth). In these cases incomplete and imprecise information coming both from above to below and from below to above impedes the adoption of correct economic decisions. The hypothesis about the simplicity and effectiveness of administrative control with the distribution of compulsory assignments along the descending hierarchy of administration is not always justified: frequently responsibility seems to "dissolve" among the units of administration that participate in adopting one decision or another.

#### The Development of an Organizational Schema of Administration

Questions raised by the existing organizational structure of the administration of industry do not go unnoticed in theoretical literature. During postwar years practical steps have also been taken which were directed toward improving this system, and the majority have been directed toward surmounting the organizational separation of the branches of industry. In 1957 a large proportion of the industrial ministries were abolished, and the territory of the country was divided into economic regions, and new industrial administrative agencies were created in each of them--sovnarkhozes. In order to provide for unity of the technical policy in branches of industry, state committees were formed for the various groups of branches. It should be recognized that this reorganization produced certain results. Specialization and cooperation of enterprises was expanded within the boundaries of economic regions, the management came closer to the "arena of action" and the role of party organizations increased. Instrument production, procurements and repair services that were common for enterprises of the region were developed, and material and technical supply improved somewhat.

But it soon became clear that the decentralization that was carried out (not without the corresponding recommendations) is not a radical alternative to ministry administration. Having partially resolved the problem of interbranch cooperation, the sovnarkhozes gave rise to a new problem--interregional cooperation. Branch and ministry barriers were replaced by territorial barriers, and the departmental dispersion only assumed different forms. "Local interests" now turned out to be hypertrophied, which presented a threat to statewide interests. And the main thing, the position of the enterprise in the system of administration and the area of its economic competence, remained unchanged. The methods of management of the enterprises also remained as they were: as was previously the case, there was a predominance of administrative levers of administration. The work experiences of the sovnarkhozes showed that without a change in the overall model of administration and its fundamental (and not just organizational) structure, the total effect of administration could not increase significantly.

The September (1965) Plenum of the CPSU Central Committee, as we know, adopted a decision concerning return to ministry administration. But it was restored on a new basis, and this was that it was combined in time with the economic reform in industry. The considerable expansion of the economic independence of enterprises that was envisioned by it opened up real prospects for the corresponding surmounting of departmental dispersion and the shortcomings of the hierarchical structure of administration. Unfortunately, this direction of the reform was not consistently maintained and its central idea--increasing the role of economic levers of administration--was realized only partially.

The changeover to a two-three-unit system of administration on the basis of the formation of production associations and combines was a serious improvement in the organizational structure of the administration of industry. It is difficult to overestimate the significance of this measure: it is intended primarily for the creation of the necessary conditions for the development of modern, progressive forms of production organization (concentration, specialization, cooperation and combination) and extensive utilization in it of the achievements of science and technology. No small role is played by the reduction of the number of units of the administrative structure--it is becoming both more economical and more effective. The provisions concerning the production association define it as a single production and economic complex, that is, as a multiplant enterprise and, which is especially important for us, a multibranch enterprise. This is precisely why the creation of associations can be regarded as a step in the direction of surmounting the organizational separation of the branches in the previous structure of the administration of industry. And it is precisely this important part of the initial design that encounters great difficulties during implementation. Interbranch associations which promise the most significant economic effect have not become widespread in practice--out of departmental considerations. The inertia of the branch approach to administration in this case outweighed considerations of national economic expediency, and the departmental boundaries between associations that belong to various ministries were not eliminated.

The introduction of general designs for the administration of branches of industry has already produced certain results, and an even greater effect is expected in the future when the possibilities created by these designs for bringing science and production closer together and improving its organization will be more fully utilized. Still one cannot but see that with the new structure of administration the situation of the main (primary) unit of industry--now the production association--has not undergone appreciable changes. As was previously the case, the higher units of administration--industrial associations and ministries--exercised detailed regulation of all aspects of its activity with the help of the previous number, if not a greater number, of compulsory indicators of the plan. In other words, control is exercised as before not only in terms of the final results, but also in terms of the means of achieving them, which limits the possibilities of the labor collectives to manifest economic initiative. It seems to us that the creation of consolidated production and economic complexes in industry which is close to completion suggests the expediency, as a final step, of granting them greater rights--in the broad area of economic decisions. This measure would naturally augment the restructuring that is taking place and would expand the real possibilities of production associations to solve the problems of development and improvement of production for which they are responsible.

The course toward creating production associations means that they will become the main and primary type of enterprise in industry. The main type, but not the only one. The experience of industrially developed states where the number of extremely efficient medium-sized and small enterprises is great and continues to grow, shows the expediency of including small organizational forms in the national economic structure. The merits of these enterprises are their flexibility, rapid adaptability to the constantly changing demand, the fact that they can be controlled better, and their economy, particularly in the sphere of rendering various kinds of services to the population. The favorable conditions for competition with the existence of a sufficiently large number of enterprises in the branch which contributes to improving the quality of goods and services and reducing production outlays should be considered to be no small factor.

The organizational structure of the administration of industry, in our opinion, should be arranged taking these considerations into account. The formation of large production associations and combines is undoubtedly the main tendency which is dictated by the patterns of the development of modern industrial production, but it should be combined in a reasonable proportion with the possibilities of medium-sized and small enterprises. Strengthening their economic independence and searching for new forms of small production organizations--state, cooperative and those based on private initiative--can make no small contribution to increasing the final effectiveness of public production. And this is the area in which the positive experience of fraternal socialist countries can be taken into account most fully.

An important condition for surmounting departmental and local tendencies and improving the coordination of central, branch and local administrative agencies are the forms of interbranch and special-purpose program planning and administration that have been developed in recent years on the basis of the decisions of the 24th, 25th and 26th CPSU Congresses. Comprehensive, special-purpose programs--socio-economic, scientific and technical, regional, ecological and others--are being transformed into a most important constituent part of the plan for the country's economic and social development, augmenting it with branch and territorial cross sections.

Valuable experience in drawing up consolidated state and regional programs and supervising their implementation has already been achieved and is becoming more widespread; the USSR Gosplan has approved methodological provisions for the development of these programs. Great possibilities for better combining branch and regional interests and more efficiently utilizing material and labor resources of the regions of the country are opened up in connection with the formation and development of multibranch territorial production complexes; the recent decisions concerning increasing the role of the soviets of people's deputies in economic construction are also in the service of these goals. The expansion of the rights of territorial agencies in planning and the strengthening of interbranch functions of the ministries are envisioned by the decree of the CPSU Central Committee and the USSR Council of Ministers of 12 July 1979 concerning improving planning and stepping up the influence of the economic mechanism on increasing production efficiency and the quality of work. One can also point out, finally, such measures as the creation of interbranch structural subdivisions in the Gosplan's staff and the formation of the commission of the USSR Council of Ministers for questions of the development of the Western Siberian Petroleum Complex and the interdepartmental territorial commission under the USSR Gosplan which is located in Tyumen.

Thus a large amount of work is constantly being done in order to widen the narrow framework of branch, or, rather, departmental, agencies for administration of industry and to strengthen the interbranch basis in them.\* All of the aforementioned and certain other forms of interbranch administration undoubtedly enrich the practice of planned management of public production, and they take into account the aforementioned new objective tendencies in its development. But with all the undoubted merits of special-purpose program methods of planning and administration, their possibilities are not unlimited. The existing practical experience, and not only domestic, shows that they are extremely effective for solving the complicated problems of an interbranch and interfunctional nature which arise periodically under the given concrete conditions and require the concentration of efforts and resources in order to achieve a previously formulated goal within the established time periods. They take advantage of the idea of matrerial structures of administration, but this is precisely why they presuppose the existence of a permanent institutional structure as well.

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\*Regarding this question see: B. Z. Mil'ner, "Problemy mezhotraslevogo upravleniya" [Problems of Interbranch Administration], Moscow, "Ekonomika", 1982.



The latter, quite obviously, can and should be augmented with special-purpose program agencies for planning and administration, but, as is correctly noted in special literature, they cannot replace it.

In our opinion, serious attention should be given to the proposal made recently in the press concerning the creation, in addition to the existing industrial ministries (and even with the possible increase in their number) of superministerial administrative agencies that embrace consolidated branches of industry. This "second story" of branch administrative agencies is to be responsible for carrying out the basic tasks--long-range development of the branches, relieving the ministries of this function and legitimizing their actual status of operational agencies for supervising the subbranches.\* Such a rearrangement of the structure of administration would actually simplify the task of coordinating the ministries and coordinating this with general branch goals--the long-range scientific and technical policies and others. Still, true, there remains the question of the interactions of large branches. Surmounting departmental barriers among them through creating a unified administrative agency for all of industry--such is the solution to this problem that is presenting itself. But it can meet with the following objections.

First of all, such a multiunit organizational structure is extremely complicated and it increases the shortcomings of the hierarchical structure of administration. But the following variant is also possible: a unified agency for the administration of industry in addition not to the existing ones but to the consolidated ministries that direct and coordinate the work of the enterprises of the branch, as a rule, directly, without intermediate administrative units (industrial associations and so forth). In this case another difficulty arises: The management of the current economic activity of the previous number of production associations and enterprises by a sharply reduced number of branch and subbranch agencies becomes more complicated. This is indeed so, but only under the condition that the previous methods of management of enterprises are retained. The intention of the recommended system consists in transferring a large part of the functions of operational control of production to the autonomously financed enterprises (production associations) themselves and shifting the center of gravity of the economic mechanism from the area of administrative levers of administration to economic levers. The first and major condition for the organization of administration on this basis will be the singling out of primary autonomously financed production units with broad and real rights to make economic decisions. The November (1982) Plenum of the CPSU Central Committee directed the work for improving the economic mechanism precisely to this area. In his speech at the plenum, Comrade Yu. V. Andropov noted: "Recently a good deal has been said about the fact that it is necessary to increase the independence of associations

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\*Popov, G., "The Development of Branch Administration of Industry," KOMMUNIST, 1982, No 18.

and enterprises, kolkhozes and sovkhozes. It seems that the time has come to begin to solve this problem in practice."

In the management of the socialist national economy, a leading role is played, of course, by the centralized basis. At the same time the greatest effect from administration is achieved with an efficient combination of principles of centralization and decentralization. Modern theory recommends centralization of goal setting and strategic tasks, and decentralization of current decisions. This is also Lenin's thesis about democratic centralism in economic management. In a planned economy it becomes possible to centralize the formulation of the economic policy of the state, and unified plans for the country's economic and social development are drawn up to implement it. These functions are the prerogative of the central agencies for managing the national economy.

The problem of the relationship between centralization and decentralization of administration arises mainly with respect to the means of practical implementation of the national economic plan that has been adopted. This is a task of correct combination of direct and indirect methods of implementing the plan and administrative and economic levers. Satisfaction of certain of the most important needs of the state (defense, intergovernmental decisions, and so forth) cannot be made dependent on the action of the commodity and monetary mechanism, and requires both the establishment of compulsory assignments for production organizations and strict administrative control. But in the majority of cases the fulfillment of the state plan can be achieved by economic means of influence, which makes it possible to utilize the advantages of decentralization of administration. These advantages are extremely great and are well known: the transfer to the enterprises of the right to make independent decisions creates real possibilities for the manifestation of their initiative and the selection of the most efficient ways of developing production. With the proper structuring of the economic mechanisms, which provides for coordination of the interests of the society and its individual production units, this initiative is directed in the path of fulfilling parts of the national economic plan. In this case economic levers of administration act as effective regulators of economic life which augment the direct influence of the state on it and make it possible to mobilize additional large reserves for increasing the efficiency of public production.

The possibility of manifesting economic initiative and socialist enterprisingness is perhaps the main condition for the creative enrichment of administrative labor and, on the basis of this, a considerable increase in its productivity. This is an exceptionally important source of the development and improvement of production, and its fuller utilization requires the organization of the administration of the economy on the basis of real autonomous financing, with an active role played by commodity and monetary relations. In the existing system of management of the economy this

requirement is not adequately taken into account: it is oriented mainly toward administrative methods of management, and therefore autonomous financing is largely perfunctory in nature. In our opinion, it is precisely here that we now find the loophole of the existing economic mechanism and it is here that large possibilities for improvement lie.

The economic independence of the primary units of production, as was already said, has reasonable limits. They are dictated by the peculiarities of the socialist economy which is based on public ownership, and also by the very nature of modern large-scale production. The increased significance of long-range decisions which determine the image of production for many years in the future, the tasks of forming a progressive structure for it and the scientific and technical policy conducted by the state, the development of the production and social infrastructure, the comprehensive assimilation of natural resources, the protection of the environment and many other things--all this explains the undoubted need to centralize the most important economic decisions which cannot be entrusted to an autonomously financed mechanism. But it can and should solve other important problems of administration: mobilization of the labor activity of production collectives, creative initiative of economic managers, the creation of their motivation for maximum effectiveness of production and, in the final analysis, the provision of the most efficient ways and means of implementing the state economic policy.

The creation of a unified agency for managing industry and the redistribution of the authority and responsibility in favor of the basic autonomously financed unit will make it possible to essentially simplify the organizational structure of administration and, to a considerable degree, overcome the shortcomings of the departmental approach and the hierarchical structure. The inclusion in this scheme of a coordinating agency means strengthening the planning basis in administration and expanding the possibilities of centralized development of the industrial policy and coordination of the activity of the branches in order to implement it. And the strengthening of economic independence of the enterprises opens up real possibilities for broad contacts among them--irrespective of their branch and departmental jurisdiction. This will also simultaneously be a development of both bases of democratic centralism and the management of the economy. The proposed system, as we can see, clearly delimits the functions of strategic and current administration of production, assigning the former to the upper levels and transferring the latter to the lower levels of the structure of administration. The more consistently this line is adhered to, the fewer the intermediate administrative units which will be required.

Let us summarize everything that has been said. The work for further improvement of the structure of the administration of industry promises the greatest success under the condition that the earmarked changes in the organizational forms are combined with the corresponding restructuring of the

methods of economic management. The requirement of a comprehensive approach to its improvement was emphasized at the November (1982) Plenum of the CPSU Central Committee. In his speech, Comrade Yu. V. Andropov discussed the need "to accelerate the work for improving the entire sphere of management of the economy" and "to create conditions--economic and organizational--which would stimulate high-quality, productive labor, initiative and enterprisingness." The realization of these points is now a state task of primary importance.

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## MERITS OF DIRIGIBLE TRANSPORTATION EXPLORED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 83 (signed to press 13 July 1983) pp 70-109

[Text] Imagine people who regularly throughout the decades gather in the evening not in order to rest or "glue themselves to the television set," and not to work late or discuss plans for future vacation trips. Imagine people who gather in the evenings in order to engage in design work and boring economic calculations. "This is known," says a knowledgeable reader, "they will be speaking about the glider of S. P. Korolev or the aircraft of R. Di Bartini. Enthusiasm for the 1920's and 1930's." It turns out that this is not the case. They are speaking about our contemporaries.

The articles offered for your attention discuss the difficult path that has been trodden by public workers who are enthusiasts of dirigible construction in the postwar years.

We are publishing a selection of articles about Soviet dirigibles in the hope that it will be useful for other new directions in technical equipment which do not always easily make their way into life.

When the material for publication was already prepared the editorial staff received news that the USSR Gosplan and the State Committee for Science and Technology supported the initiative of the USSR Ministry of Power and Electrification and the USSR Ministry of the Pulp and Paper Industry concerning the creation of dirigibles by a special planning and design division, Energoaerotrans, of the all-union Orgenergostroy institute. The activity of this division and its plans and prospects are discussed at the end of the selection.

Each of the articles touches upon similar problems, but they are elucidated from various sides so that two planes of reading result. Some readers might be interested in specific articles, for example, "Transportation for the North." Others will be interested in examining the common theme that is touched upon in several articles.

For the second group of readers the larger themes have been given titles in the selection. It contains 7 titles:

III--history of world and domestic dirigible construction;

SSS--modern condition and latest experiments;

DDD--merits of dirigibles;

PPP--demand for dirigibles and spheres of application;

EEE--effectiveness of dirigibles;

NNN--negative aspects during the course of introduction;

TTT--objective difficulties and objections of opponents.

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## PAST, FUTURE OF AIRSHIP TRAVEL

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 83 (signed to press 13 July 1983), pp 72-75

[Article by M. Ya. Ariye, candidate of technical sciences, leader of the group of enthusiasts (Kiev): "The Country Needs Dirigibles"]

[Text] Speed and universal application fully exist inherently only in air transportation.

Air transportation is extremely multifaceted. But dirigibles, these giants of the "fifth ocean," which a half century ago seemed to be the highest achievement of technical thought, have now been forgotten for a number of reasons.

III. One can trace a certain historical parallel in the development of the dirigible and of the aircraft. Both types of flying equipment are included in the transportation of the 20th century. Thus the first flight of a solid dirigible took place in 1890, and the first flight in an aircraft--in 1903. Dirigible construction developed most rapidly during the first two decades. And at the beginning of our century aircraft had extremely poor characteristics, which was brought about largely by the more complicated and less reliable aerodynamic means of supporting them in the air as compared to the aerostatic means of the dirigibles.

The designer of the first rigid dirigible in the world, Ferdinand Zeppelin, as early as the beginning of the 20th century came to the correct conclusion that only large rigid dirigibles are capable of successfully solving the problem of flight over superlong distances with a large useful load.

Even on a modern scale the first Zeppelin dirigibles were unique engineering structures. Suffice it to say that the first airship, the LZ-1, had a length of 128 meters, a diameter of 11.65 meters and a volume of 11,300 cubic meters. And this was in 1890 when they had just begun industrial assimilation of aluminum, aircraft engine building was in the embryonic stage, there were practically no light and durable synthetic film materials, and there was still no knowledge of the main laws of flight of flying equipment or methods of calculating such complicated engineering structures as the core iron of rigid dirigibles.



From the very time of birth of the dirigible many were skeptical about it. Years passed and aircraft construction developed at rapid rates. But dirigibles too confidently reached goal after goal in conquering the "fifth ocean." And in terms of many indicators (distance, cargo capacity, regularity of flights) their achievements greatly surpassed the records and achievements established for aircraft.

Let us list the facts of history.

1909--the LZ-4 dirigible completes a 12-hour flight through Switzerland without landing.

1916--the LZ-50 dirigible was constructed with a volume of 55,000 cubic meters, a speed of 100 kilometers per hour and a useful load of 32 tons.

1917--the LZ-59 dirigible during 73 hours of continuous flight covered a distance of 6,000 kilometers, and after landing it still had on board enough fuel for another 50 hours of flight.

1926--the successful flight of the Amundsen expedition on an N-1 dirigible to the North Pole.

1929--the flight of the LZ-127 dirigible around the world (a route with a distance of about 35,000 kilometers was covered with 3 landings during 12.5 days in the summer).

1937--the Soviet V-6 dirigible established a world record for duration of flight--130 hours 27 minutes.

But the string of catastrophies that accompanied the successes of dirigible construction gave dirigible opponents cause to assert that unreliability is a typical feature of the airships. The reasons for the catastrophies consisted not in any peculiarities inherent only in dirigibles, but were basically the consequences of inadequate knowledge in the area of durability, aerodynamics, materials, and also mistakes in piloting that accompanied these objective factors.

During the time of commercial operation of dirigibles several hundred thousand passengers were transported. The regularity of the flights of the airships was unusually high. The most indicative in this sense is the experience in operating the LZ-127 dirigible on the commercial line across the Atlantic, which proved that, as distinct from aircraft, the dirigible can operate in bad weather. The independence of the large ships on the caprices of the weather was also demonstrated during the time of the flight of the LZ-127 around the world. Thus in the segment Tokyo-Los Angeles, for 40 hours the dirigible traveled under conditions of dense fog and rain, with a complete loss of visibility.

But still it was precisely the accidents involving large dirigibles that became the main reason why, by the beginning of the 1940's their construction was curtailed in practically all countries.

Forty years have passed since that time. In the majority of large, industrially developed countries work is being done on an ever larger scale for designing and constructing air floating equipment of a new generation and studying their properties and capabilities. A large amount of attention is being devoted to the economic aspect of the utilization of dirigibles.

Many ministries and departments of our country are displaying a great deal of interest in aerostatic flying equipment. Individual groups of enthusiasts are also engaged in issues of modern dirigible construction.

One of these groups is the Kiev public design group for aerostatics. During 20 years of activity a number of designs of aerostatic equipment for various purposes have been developed here.

SSS: In 1975 the USSR Gosplan was presented with a design we developed in conjunction with specialists of a number of institutes of the Ukrainian SSR Academy of Sciences for systems of aerostatic transportation of gaseous and liquid fuel (SATT), which was juxtaposed to the traditional pipeline transportation of fuel. The state commission of experts of the USSR Gosplan, have comprehensively considered the design of the SATT, established that the proposed utilization of dirigibles for transporting 180 billion cubic meters of gas and 100 million tons of petroleum over a distance of 3,200 kilometers would produce an annual savings for the country in the amount of 13.6 billion rubles and would make it possible to save 18.5 million tons of metal.

Among our other most interesting projects one can note the designs of the D-1 and D-4 rigid dirigibles with cargo capacities of 14 and 140 tons, respectively. According to estimates of specialists of the Yakut ASSR, the application of dirigibles of these types just in a couple of branches of the national economy (construction, forestry and the fishing industry, geological prospecting work, fire fighting and food supply) can provide a savings of about 120 million rubles a year in the republic by 1990.

In our day it is difficult to find a branch of the country's national economy that does not experience a critical need for aerostatic transportation.

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## ECONOMY OF DIRIGIBLE TRANSPORTATION

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 83 (signed to press 13 July 1983) pp 76-79

[Article by R. P. Strong, chairman of the dirigible construction committee of the scientific and technical division (Leningrad): "Economics of Aeronautics"]

[Text] PPP. In recent decades technical thought has been striving to find transportation alternatives. This is brought about by a number of circumstances. In order to increase the efficiency factor and economize on fuel, sets of energy and chemical equipment are being consolidated. Their sizes and weight are increasing to such an extent that they cannot be delivered to the working sites in final form. Turbines and transformers weigh 200 and 300 tons, and in the future they will weigh up to 500 tons; atomic reactors now weigh up to 500 tons, and in the near future--1,000 tons; the weight of a generator even now reaches 1,500 tons. Because of transportation limitations it is necessary to disassemble or cut apart sets of equipment that have been assembled and adjusted at the plant. This makes the item more costly, reduces its quality, prolongs transportation and considerably delays the time periods for startup. Thus the country regularly wastes some of its energy.

NNN. Taking these changes into account, railroad platforms for 400 and 800 tons have been designed and constructed (but the railroad gauges have remained the same). Ports and piers that handle millions of tons are being constructed, gigantic trailers ship cargos across the plains, and new aircraft and helicopters are being put into operation.

It would be very reasonable and effective to use dirigibles for transporting superheavy cargos. The scientific and technical community during the past 20 years has discussed the problem of dirigibles at more than 10 conferences, comprehensively weighing their positive and negative qualities, and it has developed recommendations for their construction and operation.

There are quite modern technical solutions in the technical equipment for dirigibles. These include the design developments of the Leningrad, Kiev, Sverdlovsk, Novosibirsk and several other collectives of enthusiasts. One should begin with the small ones: models of small metal ships. Then one can construct medium-sized and large ones--with a changing volume--metal dirigibles without ballasts.

PPP. Each kind of transportation satisfies the needs of the national economy to one degree or another. And although each of them has shortcomings, organic or man-made, so far one puts up with them. Thus rail transportation, because of the narrow area of utilization, and the size-weight and speed limitations, has already largely reached the limits of its development. When large items are being transported the productivity of railroads decreases sharply, and the costs increase even more sharply.

Water transportation cannot be utilized everywhere, and, moreover, water shipments become more costly with the construction of road ports and because of the seasonality of the work. Motor vehicles are competitive with railroads and water transportation, but their role is reduced by the lack of roads, especially in the North and East. Air transportation--airplanes and helicopters--do not solve the problems of large shipments. At the present time the proportion of air cargo shipments in the USSR is 0.06 percent, and in world transportation--0.2 percent. By the year 2000 the volume of air cargo shipments, according to foreign predictions, will increase 5-fold and the expenditure of energy on them will amount to 20-30 percent of the entire expenditure of energy on transportation.

At the Tyumen conference on new kinds of transportation, as an alternative to dirigibles it was suggested that we create:

special wide-fuselage aircraft with a large and especially large cargo capacity (analogous to the American "Galaxy S-5A" and "Juppi-201");

cargo and passenger convertoplanes;

cargo aircraft with vertical takeoff and landing.

It was also recognized as necessary to modify existing and planned aircraft so that they have special wide fuselages.

EEE. One quickly assumes that before the end of this century the level of aviation equipment will provide for the creation of aircraft with a capacity of 200 tons, but sets of energy and chemical equipment will also be consolidated. And the most important problems of shipping large cargos, because of the extremely large expenditure of fuel, will not be solved.

Aircraft deliver freight from airport to airport, the supplies are obligated to transport their items to the airport (at least 25 kilometers) and the recipients (with the help of special contracting organizations) must drag it over areas without roads for 500 kilometers and more. At the same time the duration of the flight of a dirigible on an hour trip increases by only 10 percent, and over 5,000 kilometers--by 1-2 percent. For objectivity of economic calculations one should take not the cruising, but the commercial speed. Thus a trip of a TU-154 aircraft between Moscow and Leningrad takes 1 hour, with a distance of 600 kilometers. This means that the commercial speed is 600 kilometers per hour, with a cruising speed of 900 kilometers per hour. But passengers spend 4-5 hours on this trip, that is, the speed is 13.2-16.5 kilometers per hour. In Tyumen Oblast it costs an average of 860 rubles to transport a ton of

groats on Aerofloat. This means that over distances of 500-1,000 kilometers a ton-kilometer costs 1.6-0.8 rubles.

The return to dirigibles is dictated by the need to transport large and heavy sets of equipment, to economize on fuel and to protect the environment. Dirigibles are more efficient than aircraft and other kinds of transportation and they can satisfy the growing needs of the Far North and Far East.

An aeronaut (this is what K. E. Tsiolkovskiy called the metal controlled aerostat) can provide for inexpensive transportation of cargos of practically any sizes.

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#### AIRSHIP BENEFITS ENUMERATED

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[Article by V. F. Burkhanov, Hero of Socialist Labor, doctor of economic sciences, Moscow State University: "A Valuable Addition to Existing Kinds of Transportation"]

[Text] In the North cargo is delivered from the place of manufacture by rail or automotive transportation to the sea, river or airport, and subsequently one of these kinds of transportation is used to deliver it to the final port from where the cargo is delivered by winter transportation to the consumer.

DDD. Dirigibles and other hybrid equipment are capable of reducing or completely eliminating multistage shipments. The transshipment at the junctures of various kinds of transportation delay the cargo on route, material resources are frozen, and the quantitative and qualitative losses sometimes cannot be calculated.

There is now a possibility of creating a simpler transportation system: manufacturer--consumer or source of raw material--point of processing. Dirigibles are capable of solving the problem of increasing the transportation accessibility of regions that are newly assimilated, and in terms of a number of properties they can be a significant addition to existing kinds of transportation.

Tasks of economic development of remote regions that were set in the decisions of the party and government require new economically effective technical means for carrying them out. The problem of transportation is the axis around which almost all questions of assimilation of new regions revolves.

The effectiveness of rail and freshwater transportation surpasses all other kinds of transportation both in terms of productivity and in terms of cost. But so far there are very few railroads in the North and it takes a lot of time and money to construct them. Sea, river and rail transportation are capable of serving only a narrow "corridor" along the route, and water transportation, moreover, is seasonal and, consequently, the regularity of the arrival of cargos is violated. The effectiveness of automotive transportation is also low when there are not enough roads. Air transportation is extremely effective, especially large cargo aircraft. But it is necessary to construct costly airports and maintain personnel in them, which makes the cost of shipments on aircrafts comparatively high. Taking these peculiarities into account,

dirigible transportation turns out to be more economical than other kinds of transportation, and it has considerable operational advantages. These include transportation over the broad Russian expanses and transportation to large construction projects. For it is not enough to reach the point of destination; it is also necessary to land there and to take off in the reverse direction. For the modern dirigible takeoff and landing from practically unimproved areas involves no unsolved problems. But aircraft, especially large ones, need large takeoff and landing strips, and to construct them in regions that are difficult of access without such means of transportation as this same aerostatic equipment does not seem to be possible.

In keeping with the principle of operation of the dirigible, there can also be hybrid equipment, similar to that on ships that float in the water. The capacity of their engines is used mainly for forward movement. A number of technical and economic merits of dirigibles arise from this principal distinction:

the distance of flight of dirigibles is sufficient to deliver cargo to the place of manufacture at any point in the Soviet North;

the cargo capacity of dirigibles and hybrid equipment amounts to hundreds of tons, and in the future it can be increased to several thousand tons;

dirigibles can deliver inseparable cargos of any sizes (turbines, generators, dredges, bridges, sections of pipelines, supports for power transmission lines, residential buildings and so forth) directly from the manufacturing plant to the place of destination and provide for the assembly of the cargo that has been brought in;

modern dirigibles need practically no landing areas, which makes it possible to use them on unimproved routes in regions with difficult access. As American experience has shown, modern dirigibles can takeoff with a wind speed of up to 20 meters per second and land in a fog with the cloud bottom at 60 meters, and fly in icy conditions, that is, with very difficult weather conditions. The dirigibles can drift in the air and bypass unfavorable weather fronts or rapidly change their altitude. This, on the one hand, makes them less dependent on weather conditions and, on the other, makes it possible for them to perform a number of tasks that are difficult for other kinds of transportation: radar location and retranslation, patrolling over forests, searching for schools of fish, Arctic prospecting, and so forth;

EEE. The cost of shipment of one ton-kilometer of cargo in dirigibles is considerably less than on airplanes or helicopters. Calculations show that the economic indicators of cargo shipments with dirigibles in the North are comparable with shipments under the same conditions on railroads or on sea and river ships (4-5 kopecks per ton-kilometer). Even if one includes in the series of dirigibles necessary for solving transportation problems for assimilating the North expenditures related to the creation of a new branch, still the cost of shipments would not exceed 10-12 kopecks per ton-kilometer;

the commercial speed of the delivery of cargos from the dispatcher directly to the consumer is as great as the speed of delivery with aircraft if one takes into account that there are no transshipments. And the change in the speeds



of movement from zero to 200 kilometers per hour constitutes a significant advantage over aircraft in areas with low speeds. When it is suspended in one place, the dirigible acts as an excellent means of assembly;

the expenditure of fuel per unit of cargo delivered on dirigibles is 10-33rds the amount used on airplanes and one-twentieth-one-twenty-fifth the amount used on helicopters;

the labor-intensiveness of technical service and loading and unloading work is considerably less.

Synthetic materials which we have in our country make it possible to use very light and durable casings for dirigibles without fear of their being iced over; the achievements of science make it possible to create dirigibles without ballasts. The utilization of helium gas (in pure form or in mixtures) eliminates the danger of explosions, from which prewar dirigibles which were filled with hydrogen were destroyed. Modern aircraft engines and navigation equipment will be utilized in dirigibles, which will give them the necessary qualities during movement.

PPP. In recent years an immense range of application of dirigibles in the national economy has appeared, and in certain branches this will make it possible to radically change the methods of organizing production and sharply increase the effectiveness of money invested in the branch.

Dirigibles can be used with a great effect in the following branches of the economy:

civil and industrial construction (transportation for large-volume and large-block construction, shipment and assembly of industrial technological installations);

energy construction--the creation of electric power transmission lines, the shipment of turbines and transformers to remote regions;

the shipment of gas and oil;

the construction of main pipelines and other means of transportation (railroads, aquaducts, bridges and tunnels);

forestry (timber procurement transportation, tree dusting);

fishing and fisheries (transportation of the catch, stalking bodies of water, following schools of fish, and so forth);

geology, research work, the weather service, expedition work, and so forth;

the mining industry--the delivery of ore from dispersed deposits to ore enriching combines;

passenger and cargo transportation for remote regions without roads and with difficult access;

Arctic prospecting and assistance in guiding ships through the Northern waterway.

EEE. Calculations done by numerous design and research institutes, construction projects, geological prospecting and other research organizations show the great economic effect from the use of dirigibles in the North. We have reduced these calculations, cutting the indicators of effectiveness in half, and still received for the 10th year of operation of a series of 5 dirigibles almost 4 billion rubles in savings, which could be used for assimilating new regions of the North.

Special attention is drawn to the use of dirigibles in construction. The utilization of dirigibles here will make it possible to arrange modern industrial construction in Northern regions. As a result of the introduction of new technology of construction from prefabricated lightweight elements with a large degree of plant readiness, in civil construction in the North alone the savings could amount to 800 million rubles a year. The main reduction of the cost of construction arises from the following positions:

1. There is a considerable reduction of the construction times as a result of the delivery of large blocks from support industrial construction bases.
2. The circulation of funds is accelerated.
3. The quantity of cargo per 1 square meter of dwelling space amounts to 1 ton instead of 3.3 tons per square meter with ordinary methods.
4. In a number of cases ground assembly work can be successfully replaced with dirigibles.

The investigation of the economic effectiveness of the use of dirigibles for the assimilation of the North makes it possible to draw the conclusion that dirigibles are the most economical form of transportation that is capable of providing continuous delivery of cargo from the manufacturing plant to the point of consumption and influencing the acceleration of construction which, in the final analysis, will make it possible to include the wealth of the North in the economy of the Soviet Union.

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## DIRIGIBLES CONTRASTED WITH OTHER TRANSPORTATION MODES

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 83 (signed to press 13 July 1983) pp 84-88

[Article by Yu. I. Sotnikov, candidate of economic sciences (Moscow): "Let Us Compare, Calculate and Weigh"]

[Text] Increased cargo turnover and passenger turnover and the introduction of transit shipments require improvement of the interaction among various kinds of transportation, and also the creation of new means of transportation.

PPP. I shall give an example. The average annual structure of cargo turnover of the Nadymgazpromstroy trust is: automotive transportation--55 percent, water transportation--43.6 percent, and air transportation--1.4 percent. The expenditures are 33.6 percent, 2.2 percent and 64.2 percent, respectively. Having cost about twice as much as automotive transportation, aviation has shipped only 1.4 percent of all the cargo, or 2.56 percent of the amount of cargo shipped with motor vehicles.

Analyzing the data of the Institute of Complex Transportation Problems, the Ministry of Civil Aviation and the Leningrad Public Design Bureau of Aerostatics, one can draw the conclusion that for the particular case of shipping cargo to the region of Nadym the most acceptable kind of transportation would be dirigible transportation from the standpoint both of the speed of delivery, the sizes of inseparable parts (places), and the calculated rates of the cost of shipments.

Without being drawn into the essential advantages of using dirigibles as a specialized kind of transportation for the Far North, let us consider their position in the country's unified transportation system, having determined their possible participation only in cargo shipments.

About 80 percent of the overall volume of cargo is shipped in our country with automotive transportation. Let us see how the dirigible competes with the motor vehicle. The cost of automotive shipment of 1 ton of cargo over a distance of 1 kilometer for the average motor vehicle is 4-6 kopecks, and for the dirigibles it ranges from 36.6 to 1.4 kopecks.

Table. Main Operating Indicators of Various Kinds of Transportation

Kind of transportation	Speed, km/hour	Commercial load, tons	Productivity, ton-kilometer per hour	Tariff rate, 1 ton-kilometer per kopeck
Airplanes				
Yak-12	220	0.3	66	210.0
AN-2	190	1.5	258	90.0
IL-14	335	3.3	1,105	46.0
LI-2	220	3.0	720	59.0
IL-18	650	13.5	8,760	16.2
TU-104	850	12.0	10,200	14.9
TU-114	770	22.5	18,700	19.4
Helicopters				
KA-15	150	0.2	30	853.3
MI-1	190	0.3	57	540.0
MI-4	210	1.7	557	196.0
MI-6	300	12.0	3,600	114.0
Dirigibles				
(Volume, thousands of M <sup>3</sup> )				
6	80	1.0	80	36.6
12	80	5.0	400	10.5
24	100	10.0	1,000	6.7
60	100	25.0	2,500	4.2
120	100	50	5,000	3.0
240	100	100	10,000	2.0
450	100	200	20,000	1.4
Cargo train with VL-22M electric locomotive	80	2,000	160,000	0.3
ZIL-164 cargo truck	50	4.0	200	5.2
River steamship	26	330	8,580	0.26
Sea turbo-electric ship of the Baltika type	37	1,220	45,140	0.24

The application of dirigibles, like motor vehicles, with the same shipment times is expedient in places where there are no water routes or a developed network of railroads, for from our standpoint neither dirigibles nor automotive transportation can compete with river, sea and rail types of transportation.

As we know, Kazakhstan and Central Asia, and especially Kirghizia, where 95 percent of the cargo and 99 percent of the passengers are transported with motor vehicles, and also Siberia and the Far East have a poorly developed network of railroads, and water travel here is limited by the objective natural and climatic conditions. Let us dismiss the variant of using motor vehicles to ship cargos over a distance of up to 50 kilometers, where the cost of automotive transportation can reach 16-18 kopecks per ton-kilometer.. Let us consider the variant of application of the cargo motor vehicle and the dirigible over a distance of 200-1,000 kilometers. The truck train is a relatively advantageous and necessary form of transportation when there is no developed railroad network and with the aforementioned distances of shipments (Kazakhstan, Central Asia and the Far East).

As compared to motor vehicles it is advantageous to use dirigibles with a large cargo capacity with a commercial load of 25 tons and more (see Table). Then one can obtain an advantage not only in terms of expenditures per 1 ton-kilometer, but also in terms of the speed of delivery of the cargo (taking into account the time for loading and unloading), beginning with a distance of 200 kilometers. With the distance is increased the advantage of the dirigibles increases considerably. For both truck trains and dirigibles it is quite acceptable to use the variant of delivering passengers and cargo "from door to door," which is practically impossible for other kinds of transportation except for pipeline transportation.

#### DDD. The Main Merits of the Use of Dirigibles

1. The low cost of shipments which is reflected in the estimated cost for dirigibles with a commercial load from 25 tons--4.2 kopecks per ton-kilometer, and for dirigibles with up to 200 tons--1.4 kopecks per ton-kilometer.
2. Savings on fuel which is in short supply. The average expenditure of fuel per 1 ton-kilometer in the European part of the USSR in grams: motor vehicle--40 grams per ton-kilometer; dirigible--120 grams per ton-kilometer; airplane--400 grams per ton-kilometer; and helicopter--3,000 grams per ton-kilometer.
3. The possibility of creating airships with high unit cargo capacities, practically up to 500-600 tons of commercial load and "coupled"--with an unlimited cargo capacity.
4. The possibilities of introducing container shipments with dirigibles.
5. The comparatively low capital investments with series construction; for a dirigible with a cargo capacity of 100 tons--about a million rubles.
6. The rapid return (35-40 trips over 3,000-4000 kilometers).

7. The safety of flight during any weather and the high reliability.
8. The ecological compatability because of the small expenditure of fuel and, consequently, the lesser pollution of the environment with exhaust gases from engines and efficient application of diesel engines.
9. The possibility of applying atomic engines, which for other kinds of air transportation is not possible today.
10. The freeing of roads from being encumbered with the shipment of heavy and large cargos.
11. The lack of a need to construct sidings to remote facilities with complicated topography and the existence of large water obstacles.
12. The autonomy and the lack of a need for airports.
13. The durability (when synthetic materials are used in production).
14. The possibility of conducting repair during flying time.
15. The good compatability with other kinds of transportation.
16. The practically unlimited time of flight, especially for dirigibles with atomic engines.
17. The quite satisfactory speed of flight, especially if one takes into account the utilization of the dirigible in the cargo variant (130-160 kilometers per hour with uniform utilization of the range of speeds).
18. The possibility of using automated control of flights, control over the operation of components and sets of equipment that provide for the safety of the flight.
19. The increased coefficient of the utilization of the charge mass with an increase in the size of the dirigible, which is generally excluded for other means of air transportation.

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## AIRSHIPS CAN AID CONSTRUCTION PROJECTS IN FAR NORTH

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 83 (signed to press 13 July 1983) pp 88-91

[Article by V. A. Kabayev and V. A. Novikov (Novosibirsk): "Transportation for the North"]

[Text] The delivery of construction materials, mechanisms, equipment and fuel for the construction of new railroads is a most serious technical and economic problem. Experience shows that even such a radical and costly measure as more rapid construction of a temporary railside highway does not solve this problem.

PPP. The situation can be radically changed if principally different kinds of transportation are used for the construction of new railroads, particularly aerostatic transportation--dirigibles and towing balloons.

The complex of properties of aerostatic transportation (AST) makes it possible to organize railroad construction on quite a different basis. It will become possible, for example, to "land" construction subdivisions in remote work areas and provide material and technical support for these areas from the air. Considerably more of these working points along the route can be organized than the old methods allow.

The AST can also be used for assembly means. Then they can combine two functions: transportation and assembly. In railroad (and highway) construction the AST could radically change the entire system of work for constructing medium-sized and large bridges. With the help of the AST first it is possible to deliver the necessary materials and piling mechanisms for constructing the basis of the supports, and then the assembly of the supports and spans themselves can be carried out from the air. With the help of the AST one can successfully assemble other structures as well.

At the present time design thought abroad has proceeded even further. In France and England work on constructing balloons with a cargo effectiveness of 1,000 tons is in full swing. The FRG and Japan are also working to create a dirigible with a cargo capacity of several hundreds tons. Foreign designers are also striving to embody in the new balloons and dirigibles new principles and ideas that rely on the achievements of modern science and technology. The



periodicals have announced the existence of balloons with toroidal and lens-shaped (plate-like) forms, a combination of balloons and helicopters, balloons that are composed of four spherical shells, and so forth.

One must not close one's eyes to the fact that we are speaking about restoring dirigible construction on a principally new and modern technical basis. And there is an immense number of technical problems which require solutions here. There is also the task of creating casings that hold in the helium and there is the problem of parking them--for the sizes of dirigibles are comparable to the sizes of the largest ocean ships. With such a diversity of scientific and technical problems, there must be well-arranged planning and coordination, and creative competition which has recommended itself in the aviation industry.

It is also time to note the clear lack of correspondence between the scale of the tasks and the means of carrying them out. In spite of their limited capabilities, enthusiasts of aerostatic equipment have already done an appreciable amount of work which can be utilized fully in the future. The Kiev and Leningrad enthusiasts have developed designs of dirigibles with capacities of more than 100 tons, and the Moscow enthusiasts are developing and creating models for the assembly of a balloon-crane. Novosibirsk enthusiasts are developing a design of a towing balloon with a large cargo capacity as well as dirigibles for shipping gas. In Tyumen they have developed a technical plan for the Urengoy dirigible. Similar work is being done in other cities as well. All this comprises a good stockpile for further work on a statewide basis.

Planning agencies have long been discussing the question of creating state organizations for aerostatic equipment. So far many transportation problems related to shipping inseparable cargos and simple cargos that weigh a good deal are being solved in the old way, with immense expenditure of effort and immeasurable material expenditures. A multitude of examples of this could be given. Here is just one of them. In order to ship metal block cylinders weighing only 70 tons to the North of Tyumen Oblast (700 kilometers) they manufacture special sleds which are pulled by dozens of tractors. The route goes through the marshy tundra, the tractors frequently get stuck in the mud, and they are replaced by others . . . the entire trip takes more than a month, and 30-40 people participate in it. The operation costs several tens of thousands of rubles, and the cost of the shipment of 1 ton of cargo amounts to approximately 500 rubles. And this is not a unique situation.

On the contrary, with time the need for shipping heavy and large-size cargos to gas deposits of the North will increase. Extensive introduction of the large-block method of construction contributes to this, when the industrial object is initially assembled under stationary plant conditions and then is delivered to the place of installation in the form of large blocks that weigh several hundred tons. This method of organizing construction work makes it possible to essentially reduce the cost of new production structures and improve the quality of construction and installation work.

One recalls the article by the academicians A. Trofimuk and P. Kochina, professors G. Krylov and A. Vorob'yev and others, in IZVESTIYA (10 June 1965) which was written soon after the 1st All-Union Conference on Dirigibles and

their application in the national economy, which was conducted in Novosibirsk. This article was called "Give the Skys to Dirigibles" and in it they said, in particular: "Our country is in vital need of dirigibles . . . there is a clear need to create a special state committee for dirigible construction which should have its own scientific research and training institutes, design bureaus and plants." Thus the question of dirigibles was raised on a broad and large scale 3 five-year plans ago. Time has only increased the urgency of the problem. During the past decade and a half no new (principally new) kinds of transportation have appeared which are capable of competing with aerostatic transportation. The question of creating a special state organization for dirigibles remains open.

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## CERTAIN ISSUES MUST BE RESOLVED

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[Article by A. N. Lavrent'yev and V. S. Podosinov, engineers (Moscow Oblast): "You Have Heard the Enthusiasts--Now Listen to the Skeptics"]

[Text] The numerous articles by enthusiasts and defenders of aerostatic means of transportation (AST) devote a good deal of attention, on the one hand, to enumerating the advantages of their utilization and, on the other, to the historical aspects of the bureaucratic and narrow departmental approach on the part of various administrative agencies when solving the problem of organizing a new branch of industry. But a minimum of space and attention has been devoted to the technical aspects of designing, producing and operating them. The unsystematized data regarding the economic effectiveness of the use of dirigibles and balloons in the national economy are impressive, but they are not attached to specific designs.

TTT. From the articles it is not clear which technological design path the development of the AST should take, and which key technical problems should be resolved and optimized. It is necessary to have a standardized approach to the technical and economic justification for the production of equipment for various purposes. Then the following key issues that pertain to the design and operation should be resolved fully and unambiguously.

1. The selection of the gas for filling the balloon (the shortage of the product; the volume of its production; the cost, the peculiarities of the design related to the properties of the gas; the technological peculiarities of filling the balloon; the amount of leakage and replacement of gas during operation; questions of technical safety).
2. The selection of the material for the casing of the balloon with permanent or variable configurations, using metal or plastic coating (weight and value characteristics of the material; volumes of industrial production; operational characteristics, including durability when operating under extreme conditions, that is, the reserve of durability, guaranteed service life, and so forth).
3. The selection of variants of force spatial design and provision of the configurational sizes of the balloons with various cargo capacities (the shortage and cost of material; the durability and weight characteristics of

the material; the peculiarities of the technology for assembly; the peculiarities of the cycle resistance and durability of the covering material in interaction with the force spatial design, and so forth).

4. Parking and storing dirigibles (the dependency of the technical resource on the conditions for parking and storing, capital and operational expenditures on design variants of open and closed storage areas).

5. The provision of the AST with power engineering (the selection of the kind of engine and the power installation for a number of dirigibles in terms of cargo capacity; capital expenditures and savings on operations; ecological aspects of operation).

6. Means of technical diagnosis, regulation and control.

7. Service personnel (crew, personnel for service during parking and storage).

The main issue in dirigible construction, which determines both the design and operational as well as the economic aspects is the selection of the gas bearer. The utilization of hydrogen is limited by its danger of explosion. Helium is theoretically preferable as a filler for the balloon. It is now difficult to use it in practice on a large scale because of the most critical shortage and the relatively high cost (up to 28 rubles per 1 kilogram). The process of extracting helium from the air is a secondary process when producing liquid nitrogen and oxygen. The use of a mixture of gases, water vapor or other more exotic gases (for example, freon) requires all-around comprehensive research. One cannot forget about ecological problems.

Only after solving this problem can one move on to selecting materials for the design. The glibness with which enthusiasts speak about utilizing synthetic materials when creating AST can tempt many. But this is also a serious problem. In the first place, synthetic materials cannot fully replace metal in terms of their durability and operational characteristics; in the second place, they are in no less short supply and require not only one-time capital expenditures, but also high permanent operational expenditures. It is also necessary to find out how the physical and durability characteristics of material change under climatic and radiation (solar) influences, in contact with force spatial designs of the balloon under the conditions of loading with a current of atmospheric air, snow, wind, dust and so forth.

It is obvious that the conditions for parking the balloon at a mooring mast will be difficult from the standpoint of the duration of its operation. Therefore the question of constructing storage grounds (very large and therefore also expensive) for parking and preventive maintenance inspections and repairs is very complicated and requires preliminary design research.

On the basis of this extremely superficial list of problems with the AST, it seems to us that one cannot seriously talk about immediate development of a base for industrial assimilation of this new kind of transportation. We can no longer begin to produce large amounts of technical equipment with individual, even if they are brilliant, design decisions. It is necessary to have a comprehensive study of the problem.

Theoretically, the problems listed above can be resolved. Consequently, it is necessary to begin with this. Only after a comprehensive study of them is it possible to reveal the weak spots of the design and operation, to focus attention and means on them, and to determine the optimal ways of creating the AST and the expenditures of material, financial and human resources that are necessary for this.

The result of this coordination work (which in parts is within the power of public design bureaus) should be the publication of technical and economic substantiation with a list of products and volumes of materials necessary for constructing special structures, subsequent one-time current expenditures, and on the whole, economic expenditures for the range of balloons with various cargo capacities and the time periods for recouping these expenditures.

It is also necessary to have a strict classification of all the defects that exist in operating the AST, the reasons for their appearance, the possible consequences and the design and organizational measures necessary for eliminating or localizing them.

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#### FURTHER DEVELOPMENTS ANTICIPATED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 83 (signed to press 13 July 1983) pp 95-101

[Article by I. Ye. Boyechin, editor of the magazine TEKHNIKA--MOLODEZHI (Moscow): "A Prolonged Dispute"]

[Text] At the beginning of the 1930's a well-known dirigible builder and flyer, General Umberto Nobile, who was famous for his bold flights across the North Pole, was invited to the Soviet Union. Nobile worked for several years in our country, participated in the development and creation of a series of dirigibles and studied fairly well the condition of air transportation in order to draw quite definite conclusions about the prospects of the development of certain kinds of it, particularly dirigibles.

"If there is a country on earth where dirigibles could be developed and be applied extensively and effectively, this country is the Soviet Union with its weather conditions which are exceptionally favorable for flying them and its expansive, primarily level territory, where the distance from one population point to another, especially in Northern Siberia, makes it so difficult to construct highways and railroad mainlines," he wrote. I took the liberty of printing such a long quotation from Nobile's book "Red Tent" only because it went out of print in the 1960's.

III. And by that time heavy transport aircraft had firmly established themselves in the skies along with the most varied helicopters and, in the opinion of the majority of specialists, the age of the "air cigar" had come to an end long ago after a number of sensational catastrophies which occurred before World War II. The destruction of the Macon and Dichmude dirigibles and the mysterious explosion of the gigantic Hindenburg over the Langley airport disturbed the ideas of the contemporaries so much that discussions of the danger of the 200-meter zeppelins ended with complete rejection.

Aircraft, which only 2 decades ago seemed unreliable and frail, suddenly became powerful steel birds (you will pardon my high flown language), with high speeds which have almost conquered the stratosphere and finally become a reliable and comfortable kind of transportation.

Few knew that the military dirigibles proved themselves excellently in World War II. There was obviously a need to keep the military secret.

People practically forgot about dirigibles. And suddenly, after 4 decades, they have begun to discuss them again. Of course this is far from an accident. It turns out that the modern giant airplanes like the American L-500 which lift up to 110 tons of useful cargo can fly and land only on the strongest concrete strips that are many kilometers long, and the most powerful helicopters are capable of lifting no more than 2 dozen tons and transporting them a distance of 200-300 kilometers. And with an increased flying mass of the aircraft it is inevitably necessary to lengthen and strengthen the "concrete strip" (which in and of itself is fairly disadvantageous), and therefore the landing of such mastadons on an unequipped ground "pocket handkerchief" becomes absolutely unrealistic. As for helicopters, a large proportion of their power goes for keeping the machine itself in the air. And yet the German dirigible the Hindenburg as early as the end of the 1930's regularly completed trips across the Atlantic, taking up to 126.5 tons of useful cargo on board.

People recalled this only in the 1960's when life itself forced transportation workers to change over to mass air shipments of large-sized cargos weighing more than 100 tons directly from the plant sites to the construction sections.

SSS. At that time in many countries of the world, one after another, plans began to appear for aerostatic flying equipment of a new generation, and moreover the first models, which were rid of the fateful shortcomings inherent in their predecessors, rose into the air. These machines were not made of resilient, but fragile steel; they were made of the strongest light alloys, artificial materials, and their balloons were filled not with explosive hydrogen, but with safe helium, and modern navigational equipment appeared in the pilots' cabins.

Aerostatic flying equipment has already undergone testing in the skies over France. They prove themselves as fairly good means of assembly. Transportation dirigibles made in West Germany worked fairly well over the jungles of Africa. In the foreign press it has been repeatedly emphasized that this equipment will be most widespread precisely in the developing countries which do not yet have a developed network of ground communications. Counting on the promising orders, a number of firms of capitalist countries have already begun to design aerostatic flying equipment with various volumes and purposes.

Judging from everything, in the next few years we can expect if not a new "airship boom," then a gradual, steady introduction of a new generation of zeppelins into air transportation where, according to the calculations of experts, they can give serious competition to large-tonnage airplanes and helicopters.

But what is our country doing in this respect? A very great deal, and there is not the slightest exaggeration in these words. Not to mention the hundreds of engineers, designers, scientific workers, other workers, students, drivers, fliers, and kolkhoz workers who self-sacrificingly although separately are working for various institutions on their own designs for dirigibles, this problem is being dealt with seriously by a number of collectives which bring together professionals with excellent training. Thus young engineers who are



workers in the group that is engaged in film covering designs, in creative cooperation with workers of the Sverdlovsk Architectural Institute, have developed carefully thought-out plans not only for aerostatic flying equipment of a nontraditional form ("flying wings," "plates," "cranes"), but also a plan for an enterprise to produce this equipment.

According to the design of the Sverdlovsk workers, it should include a plant that produces dirigibles, a flight testing station, a scientific testing station and a scientific research center. Specialists who have had occasion to become familiar with the work of the Ural workers have noted its professional development, elegance of execution and complete correspondence to the technical requirements of modern times.

In the spring of 1980 at the Ufa Petroleum Institute they demonstrated an original model of an "air trolley." Operating from commands from the control board, the 3-meter cigar rose to the ceiling of one of the auditoriums, turned around and came down. According to the calculations of the authors of the plan, Professor A. Spivak and docent G. Valil'yev, this equipment, receiving electric energy from a suspended line, will be able in an hour to cover a distance of 80 kilometers with a cargo of 800 tons or up to 1,000 passengers. The authors designed this flying machine especially for regions of Siberia and the Far East.

In Moscow a group of enthusiasts headed by candidate of technical sciences A. Larin, submitted for the consideration of experts a variant of a principally new flying machine in which the lifting force, created by light gases, is multiplied by the work of propellers of the helicopter type. This machine, in the opinion of the authors, will be much more maneuverable than the zeppelins, and, consequently, safer than they are. In the Kiev Public Design Bureau they have done so much serious work that extremely solid firms of the leading capitalist countries are interested in the results.

Extremely interesting and useful work on the investigation of the possibilities of classic dirigibles under modern conditions has been done on a high professional level by a group of veterans of air travel and young specialists in Moscow and Leningrad. They have managed to achieve a successful combination of past experience and essential problems of economy. When beginning their research they clearly understood the desires of the potential clients for aerostatic flying equipment, with whom they had arranged stable connections during the time of representative scientific and technical conferences which have been held in past years in Leningrad, Novosibirsk and Nadya.

PPP. Let us try to hear those who express the opinion of the potential clients of the new technical equipment. A large amount of technical equipment is now being sent to the regions of Siberia and the Far East which are being assimilated, and roads and villages are being constructed there. I am referring to the statement of Hero of Socialist Labor, academician N. Cherskiy (Yakutsk): "One thing is clear: without this equipment the assimilation of the Far North, especially its coastal zone, will involve immense expenditures and immense damage to nature."

A similar viewpoint is held by the chief of the Urengoy comprehensive scientific research expedition of the Tyumen'gazprom all-union production association, G. Yepikhiyev, who has repeatedly complained about the lack of cross-country transportation among the Siberians. "The need to create and introduce new means of transportation and installation is obvious," he asserted. "They will be used when constructing pipelines, building up oil industries, and installing complicated technological units." Dirigibles, in Yepikhiyev's opinion, can solve another important problem--protecting the environment. In our day drilling installations and other heavy equipment are portaged to the place where they are to be used, and only during the winter.

After such a caravan in the tundra and the tundra "there remains a dead strip up to 70 meters wide, which grows again in 15 years at best . . . and during the summer it is impossible to conduct such an operation. But with the help of transportation and installation means, such weights can be transferred within a couple of hours, and nature will remain whole and preserved." The same viewpoint is held by the Leningrad engineers, R. Zhukov and Yu. Tkachev, who suggest refraining from constructing any kind of temporary villages, roads and other temporary structures, and "instead of them delivering standard technological and residential module-blocks to the mine or the petroleum deposit." It is simply unthinkable to do this without such powerful machines as dirigibles.

Workers of the Sibkomplektmontazh association, A. Gul'ko and V. Klepikov, think the same thing. At the enterprises of which they are in charge they manufacture pumping and compressor stations in block form and other units weighing 100-200 tons. So far they are delivered on the routes of petroleum and gas lines that are being constructed along the rivers.

EEE. In the survey prepared in the Yakutsk center for scientific and technical information it recalls that "the application at construction sites and industrial facilities of the republic of 215 dirigibles with a cargo capacity of 14 and 125 tons will produce an annual income which will fully make up for expenditures on their construction and operation." Doctor of technical sciences O. Chembrovskiy was right when, on the threshold of the 26th CPSU Congress, he wrote on the pages of PRAVDA: "The dispute about the expediency of applying aerostatic equipment has clearly been drawn out, but this matter of great state importance is standing still."

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## PROPOSALS FOR REVIVAL, WIDESPREAD USE OF DIRIGIBLES DISCUSSED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 83 (signed to press 13 July 1983) pp 102-109

[Article by O. A. Chembrovskiy, doctor of technical sciences, professor, chief of the special planning and design division of "Energoaerotrans," and V. I. Panferov, candidate of technical sciences, deputy division chief (Moscow): "Dirigibles on the Threshold of Application"]

[Text] Everyone is talking about dirigibles: their contemporaries, who lived through the boom of the 1920's-1940's, and the younger generation who know about them from others. Public opinion is approximately this: during the period of the establishment of aviation, dirigibles were prepared to take on the role of mass air carriers, but they turned out to be unviable because of the great danger of fire and the great difficulties in producing and operating them. Subsequently the rapid development of aviation, especially during the prewar and war periods, and soon after, the birth of the space age pushed dirigibles into the background, leaving them to be thought of as a technical means that had outlived its time. But few of their contemporaries assumed that in the 1980's a great need for them would arise: tasks are appearing which modern technical means are not capable of carrying out because of the high accompanying expenditures of human and material resources.

What factors motivated the numerous groups of veterans of dirigible construction and the younger enthusiasts to search for ways of creating modern aerostatic equipment and systems based on them?

Factor number one is the most critical problem of transportation in the newly assimilated regions of Siberia, the Far East and the Far North. Transportation shipments in these regions cost the state an extreme amount.

The second factor is the acceleration of the rates of construction, the increased volumes of production and consumption and, in the final analysis, the increased volumes of shipments. In this situation "door to door" shipments are preferable, but only automotive transportation (if there are roads) or helicopters can provide for them. The third factor arises as an obstacle on this path--the sharp increase in the unit weights and sizes of cargos that are being shipped. Industrialization of construction requires a high degree of factory readiness of sets of equipment, components and elements of energy,

chemical and other facilities, and the changeover to unit masses of cargos in the tens and hundreds of tons.

Without even mentioning many other factors, let us summarize: it is necessary to have a new kind of transportation which does not require ground communications and is capable of shipping "door to door" large-sized and heavy cargos, and also, if necessary, assembling them from the air. Turning to aerostatic equipment was a natural solution to the problem. The approach to their creation is now being determined not by the positions of the enthusiasts or skeptics, but by the tasks of the modern day, the achievements of aviation and rocket construction, chemistry, electronics and other fundamental directions of science and technology.

Today the work for creating aerostatic equipment is being carried out extensively throughout the world. Certain countries for a number of past years have been testing experimental models of them, which create a basis for confident and extensive application of them in the economic sphere.

Let us give the prerequisites which are necessary for the appearance of a new generation of domestic aerostatic equipment.

In planning--the creation of designs which will maximally utilize the materials, components and sets of equipment in domestic industry, and also systems that provide for high safety and regularity of flights as well as simplicity of technical operation and special-purpose application.

In production--on the basis of the manufacture of aviation and other technical equipment, the organization of extensive cooperation which will make it possible with minimum volumes of additional capital investments to create new assembly and other industries for aerostatic equipment.

In operation--the construction of principally new systems and structures of the ground complex, including mobile ground complexes that provide for storage and operation of the equipment without storage space in any climatic regions of the country; and maximum utilization of technical means of air navigation.

In organization of the work--extensive cooperation of involved ministries and departments (for example, on a shared basis); the combination of collectives that are carrying out the basic stages in the chain of science--planning--production--operation; maximum simplification of the interactions of the clients with the organization that owns the equipment (perhaps according to the principle of wage rate payment for work, which is applied in civil aviation).

There are real possibilities of solving these problems. Thus the large amount of experience in planning aircraft systems can be used successfully when creating aerostatic equipment. Contributing to this is the fact that throughout the entire world the most promising is considered to be the semirigid type of aerostatic equipment which consists of a soft casing and a rigid suspension system composed of elements of modern aircraft, helicopters and other equipment. Such a successful, in our view, combination has reduced the number of principally new problems for creating material and casings for the aerostatic

equipment to a minimum. The modern level of development of domestic petrochemical and light industry makes it possible to solve these problems without special difficulties. The great safety and regularity of the flights is provided by the utilization of inert helium as a filler for the casings. Its production will require a certain increase in the capacities for producing it in the country.

Technical operation and ground service will require an independent gas service. This is a difficult task, but it can be resolved. Experience in operating dirigibles, both prewar and modern ones, makes it possible to hope for success.

The main difficulty is the creation of a production base. This difficulty can be surmounted by maximally utilizing in the design of the equipment components, sets of equipment and systems of modern aviation equipment, particularly engine installations, transmissions, propellers, cabins and so forth. The result is a considerable advantage in time and money for the assimilation of the output of special components of the equipment. This can be achieved only with the active participation of plants that supply the aviation industry, civil aviation and other ministries and departments.

It is possible to assemble the equipment at any machine building enterprise with a small amount of modernization. Incidentally, the planning and production of aerostatic equipment in the majority of countries of the world is not being carried out by aircraft firms, since the main difficulty consists in creating the casings and not the suspension part..

Dirigibles can be operated according to the following principle. At large administrative centers regional ports for basing them are created, including buildings and structures (including hangers) which are necessary for completing the assembly of equipment or capital repair. Assigned to the regional center are several mobile detachments of equipment with various cargo capacities which are capable of doing transportation and installation work at facilities that are located within a radius of 750-1,000 kilometers. The mobile detachment includes mobile means that are necessary for technical operation and are also shipped by the equipment itself. Such means are extensively applied in subdivisions of civil aviation and other ministries and departments.

When dirigibles are not stored in hangers it is necessary to be able to protect them from snow, wind, rain and ice. This problem is being solved by institutes of the State Committee for Meteorology and Environmental Protection as well as other ministries and departments. It is especially important to learn to moor the equipment and also to provide for its storage under extreme conditions. The path to the solution is found in mobile docking and mooring masts and systems that make it possible either to feather the casing in the wind or to place it in a container during hurricanes and other storms; then the gas filler is pumped into a mobile or stationary storage facility. One must not forget about the possibility of basing the equipment in natural covered areas, and also transferring it to safe places when storm warnings are received.

Today there is practically not a single branch, beginning with geology and ending with the construction of atomic electric power stations, where there is not a sphere for the application of aerostatic equipment. But it is not

a simple task to organize its utilization. This task is complicated by the fact that the rebirth of dirigible construction is now being handled only by those branches which are potential consumers. A proposal has already been made on the pages of EKO to create an interdepartmental organization for air floatation\* and, in our opinion, it is not without justification. Cooperation in the creation of equipment inevitably leads to cooperation in its application, and this, in turn, requires the creation of an agency with interdepartmental rights and responsibilities.

But these are problems of the future. At the present time the special planning and design division, Energoaerotrans of the All-Union Orgenergostroy has more than 2 years of work behind it, it has accumulated experience, and results are being planned.

Our division is the first organization which during postwar years has officially engaged in the creation of dirigibles on the basis of modern science and technology. Its appearance was preceded by a large amount of work on the part of enthusiasts who were students and professor and teaching personnel from Moscow VUZes. They studied various forms of equipment, earmarked technical decisions and revealed those which correspond most fully to the conditions of the problem. They constructed and tested more than 10 large-scale flying models, and after the creation of the organization--6 more. In the flights they investigated the aerodynamic and dynamic characteristics, the resistance to bursts of wind when doing transportation and installation work; and they revealed the most successful solutions. Only after this was one of the remote control models, which was one-tenth the actual size, demonstrated at the all-union conference for atomic construction. The conference adopted a decree concerning the expediency of further development of work within the framework of the staff subdivision of the All-Union Orgenergostroy Institute.

As the basic stage in the rebirth of dirigible construction the Energoaerotrans division was instructed to create experimental equipment with small cargo capacities (up to 10 tons), the results of whose testing would be the foundations for adopting technical decisions concerning equipment with cargo capacities of 30-40 tons and more. But, in our opinion, it was mandatory for the creation of such large dirigibles to be preceded (and it already was preceded) by a verification of the main technical principles and decisions using models. I should like to discuss this in greater detail and begin the conversation with the historical episode in which the author was one of the participants.

The youth who engaged in the construction of aerostatic and other types of flying equipment were welcome guests in the home on Zubovskaya Square of the patriarch of aerostatics, the head designer of the Komsomol'skaya pravda and Khimik-rezinshchik dirigibles, Nikolay Vasil'yevich Fomin. It was in 1934 that Nikolay Vasil'yevich expressed a wish to meet professor K. L. Bayev, who was in charge of the Moscow Astronomic and Geodesic Society. They met, and at the first meeting S. P. Korolev joined them. Nikolay Vasil'yevich expressed the idea of the similarity of the external forms of the dirigible and the rocket. Sergey Pavlovich answered this saying that in spite of the

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\*Latsis, O. R., "The Joint Stock Company: The Well Forgotten Past," EKO, 1980, No 3.



external similarity, in terms of the degree of readiness for extensive utilization, the two kinds of equipment were separated by an abyss: the golden age of the dirigibles had already come, but the space age was still quite far from being a reality. In the words of S. P. Korolev, the "grandfather" (this is what K. E. Tsiolkovskiy was sometimes called) is not dealing with these two areas by accident, since he sees that with time they will enrich one another. K. L. Bayev then expressed the idea that space travel would be essentially impoverished if it did not take advantage of the equipment with explosive force in order to investigate the planets of the solar system which have an atmosphere (Venus, Mars, Saturn and Jupiter). Sergey Pavlovich then said that he saw a real possibility of beginning to work on space rocket equipment: this is confirmed by the experience in creating various kinds of rockets here in the GIRD\* and also abroad. The large amount of experimental work that was conducted with the help of, as he put it, equipment of "small forms," produces confidence in the need to change over to state organizations.

The creation of fairly large existing models was the natural accompaniment to the work on a public basis and in the initial stage of the activity of the state organization. And we know that it was precisely the practical achievements of the GIRD and the GDL\*\* that provided the basis for creating the first rocket scientific research institute--RNII.\*\*\* S. P. Korolev noted that no mounds of paper could be as convincing as the flying "small form" objects. Our division is following this path. When we hear the discussions of the authors or their opponents about one technical decision or another there arises the desire to say one thing to them: try to verify it in an experiment.

One might ask why we have been standing still for almost 40 years now. Many blame certain bureaucrats for this. But one cannot agree with this. First of all we ourselves must be blamed for the fact that in our day we were not in a position to convince people of the viability of our proposals. And managers who have become accustomed to realistic evaluations understand well how far good intentions are from their realization.

In this sense the "small forms" by means of which you convince someone that your solution is viable are the most convincing argument. The term "small forms" with respect to dirigibles has a certain conventionality. The impossibility of linear transformations when changing over from a model to the actual object makes it necessary to search for a solution in a natural or almost natural model or in experimental equipment. Of course, money is needed for this, and here again arises the question of creating an interdepartmental organization. In essence, our division is already this. Participating in its financing and support for its work with labor and other resources are the Ministry of Power and Electrification, the Ministry of the Timber, Pulp and Paper Industry and the Ministry of Geology of the USSR and the RSFSR. A number of other interested ministries and departments have joined actively in the work. Several dozens of enterprises and organizations of 16 ministries and

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\*GIRD (Group for study of jet movement)--an organization of enthusiasts who laid the basis for the development of Soviet space equipment. It received its official status in 1922.

\*\*Gas Dynamics Laboratory--the research organization that developed jet engines. It existed from 1921 through 1933.

\*\*\*RNII--Scientific Research Institute of Jet Propulsion. Formed in 1933.



departments cooperate with the Energoaerotrans division in the work for creating experimental equipment, and this group is expanding.

We are deliberately not considering such an important subject as the effectiveness of the application of dirigibles in the national economy. Specialists in the most varied branches discuss this a great deal, and sometimes not quite objectively. I should like to emphasize one peculiarity of these calculations --the utilization of data concerning rigid dirigibles alone as a point of departure. There is no domestic experience with this type of dirigible and the utilization of the data concerning foreign prototypes does not guarantee reliability. Moreover, all the calculations are conducted on the presumption that they will require new engines, sets of equipment and components, and also new capacities for producing them. In the planning of our models we use the principle of maximum realization of the results achieved as of today in other branches, and this radically changes the position from which one comprehensively evaluates the effectiveness of the creation and application of aerostatic equipment. Moreover, many authors forget about the possibility of their utilization on the side for protecting the environment, for radio and television broadcasting, and so forth, that is, in nontransportation spheres, but ones which have a great future.

During past decades dirigible construction practically lost the results it had achieved at one time, including technology, special productions and personnel--both design and flight-operating personnel. Therefore the Energoaerotrans division is exerting efforts to create a new foundation for Soviet dirigible construction. The division has created a council of veterans of aerostatic travel which is headed by the former pilot of the V-6 and V-12 dirigibles, V. Ustinovich. Contact has been established with practically all the public design bureaus for aerostatic travel in our country. On the whole the collective is living a full life and engaging in an interesting new business, applying all efforts in order to accelerate the development of dirigible construction.

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## ATTITUDES OF YOUNGER GENERATION TOWARD WORK, RESPONSIBILITY.

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA  
in Russian No 8, Aug 83 (Signed to press 13 July 1983) pp 110-128

[Article by M. Levin: "Youth and Labor"]

[Text] How do modern boys and girls feel about labor? The urgency of the problem is shown by the words uttered at the 26th Party Congress to the effect that certain young people manage to acquire professional training while their attitude toward labor is not responsible enough.

This subject was also discussed at the June (1983) Plenum of the CPSU Central Committee. "True to communist ideals and revolutionary traditions," said Comrade K. U. Chernenko at the Plenum, "youth are working in the vanguard of the five-year plan. The future of our system is in reliable hands. But the party also sees negative phenomena in the youthful environment. They are bothered by the delayed civil development and the political naiveté, the dependency of certain young people, and their lack of desire to work in places where the society needs them today."

The interrelations of "worker--production" are discussed by the journalist M. Levin and Leningrad sociologists--the head of the division of the Institute of Socio-economic Problems of the USSR Academy of Sciences, doctor of philosophical sciences V. A. Yadov, candidate of philosophical sciences A. N. Alekseyev, and junior scientific worker of the Scientific Research Institute of Comprehensive Social Research under Leningrad State University imeni A. A. Zhdanov, N. Yu. Shcherbakov.

Their conversation touches on observations which, although local, are of undoubted interest.

### Labor--Only a Means for Everything?

Journalist: Since childhood, man has heard that his future place in society and success in life is related precisely to labor, that it is primarily in labor that he acquires his worth, independence and meaning for existence. So long before the beginning of labor activity a certain preliminary attitude is formed toward labor, which then undergoes the test of personal experience. But here when certain ideal notions come

up against reality, which far from always coincides with youthful dreams, there are problems. How does production receive young people? How do they relate to work, which is something new for them?

We know that the results of a detailed investigation of working youth in Leningrad conducted in 1962 are presented in the book, "Man and His Work" (Moscow, "Mysl'", 1967). In 1976 another investigation was conducted. Apparently the facts and results that were accumulated make it possible to judge the dynamic of this process?

V. A. Yadov: I wish to emphasize that this research was carefully prepared for and conducted by a large scientific collective. The results of the questionnaire conducted in 1976 are still being processed. Naturally, the interpretation of material that has already been acquired not only produces answers, but also raises new questions; new ideas and hypotheses are originated, which are verified during the course of current work and simultaneously give impulse to the preparation of another investigation. On the basis of these data one can draw certain conclusions. Our conversation will be about them.

Journalist: Have not the 1976 data become outdated?

V. A. Yadov: Well, in the first place, the attitude toward labor is not like the weather, it does not change essentially during a year or two or three. In the second place, the large scale questionnaires conducted in 1962 and 1976 are an important and largely irreplaceable but, of course, not the only source of information. The circulation of questionnaires, interviews, observations, other methods and, finally, our many years of experience enable us to trace the dynamics of various tendencies in the attitude toward labor.

Journalist: In that case, what are these tendencies?

V. A. Yadov: We see one of the major conclusions in the fact that some of the youth are undergoing the so-called instrumentization of their attitude toward labor, that is, the basic values of labor are shifting from the sphere of its content to the area of working conditions and remuneration. People are affected by the kind of work they do, but they are affected even more by the conditions in which they work and what they receive for it. At the beginning of the 1960's the content of work, the possibilities of advancement, and interest in the work process itself were of greater significance than working conditions and earnings. Today one might say that they have become equal with respect to motivational significance. All possible variants of the attitude toward labor can be conventionally reduced to two: it is perceived as an independent value which satisfies profound demands of man--as K. Marx wrote, a self-valuable activity--or it can be perceived as a means of achieving other goals in life that are external to the process of labor.

Journalist: Does this change not reflect, if only partially, changes not in the attitude toward labor itself, but in the way people talk about it? Perhaps the same ideas have come to be recognized more clearly and formulated more candidly?

V. A. Yadov: This explanation is not ruled out. But it is wrong to juxtapose closely interactive parts to a unified whole. Moreover the objective aspect of the matter is registered independently of how the worker speaks and thinks of himself. If, for instance, he does not fulfill the norms, and submits slipshod work, this already shows his attitude toward labor, regardless of the words he uses to express this attitude. In general none of the conclusions of sociologists arise directly from the statements of those who are questioned. There are tested methods which are constantly being improved which make it possible to eliminate from the results the influence of factors that distort the true state of affairs.

For instance, a question in a questionnaire: "What is your attitude toward labor?"--to put it lightly, is incorrect. Everyone understands this in his own way and answers accordingly. Of course sociologists cannot eliminate this. Moreover, even if one supposes that because of some fortunate accident everyone will understand the question in the same way, the answer to it will still not show the real attitude toward labor. Man is too complicated for even the sincerest evaluations and statements about himself to be perceived as a precise reflection of what exists in fact. Moreover, people far from always recognize their own interests, motives and incentives, and that which they recognize they are not always willing and able to describe. Therefore, almost the first professional commandment of the sociologists is to verify and to verify again. It is necessary to eliminate both differences in the understanding of questions and vagueness of possible answers. The person being questioned should understand precisely what the question is, and the sociologist must know what the data he receives mean and be able to interpret them correctly. And, as a rule, the answer to a general question, for example, about the attitude toward labor, is formed from many constituent parts. I can assure you that the conclusion about the instrumentization of the attitude toward labor is certainly not a misunderstanding, although we do not insist that it applies to all categories of soviet youth.

Journalist: But this conclusion seems unexpected, at least at first glance: youth are becoming more and more educated, cultured and professionally trained, and consequently they should be more oriented toward the content of labor, toward creative, spiritual and moral satisfaction, and not toward money and other benefits.

V. A. Yadov: One should not confuse what should be according to the logic of things and what actually is. Unfortunately, people who write about social problems frequently forget about this. Even the most logical presumptions are sometimes not confirmed in practice. Sociological research

is even more valuable since it makes it possible to establish the cases in which apparently predictable processes exist and those in which they appear in a distorted way.

The data from our investigation which was repeated in 1976 show that either the link between the higher general educational, cultural and technical level of the population and their attitude toward labor is certainly not a directly linear one yet, or there are other factors in operation here that outweigh the influence of this higher level. In particular, the question arises: are the tendencies that are revealed not sometimes the result of precisely the high education of the youth?

N. Yu. Shcherbakov: In this respect, the data we managed to obtain at one of the Leningrad plants is remarkable. It illustrates well the causes for this phenomenon.

On the whole for working youth who come to the plants today it is typical to have a fairly high level of education as compared to the past and more developed needs for creativity and the acquisition of new knowledge, the diversity of activity, broad and interesting communication, participation in social life and general plant affairs, and a rise in their social status. This is a good prerequisite for successful social development of the collective and its increased productive potential. But this also gives rise to a number of social problems.

Young people place high (but, as a rule, not excessive) requirements on the content and conditions of labor, organization and public life at the enterprise, the nature of interrelations among people, and the personal qualities and style of work of their mentors, foremen and management. For various reasons production far from fully meets these requirements, which the newcomers discover fairly quickly. At the enterprise we investigated, for example, the working conditions in the majority of shops left something to be desired. Naturally this does not contribute much to the formation of a stable interest in the work. The plant has no club, sports complex or hall which can be placed at the disposal of the youth, and leisure is organized on a low level. The conditions for continuing education are also not very favorable: officially they refer to advancing skills, training and enriching the personalities of the workers, but in fact evening and correspondence classes are "inconvenient". They cause problems with the schedules, the distribution of employees and the fulfillment of production programs, and therefore the noble desire for training, professional growth and self-improvement is not supported by the shop administration. Frequently a young person who is "too developed" causes the enterprise a good deal of worry and becomes an undesirable figure.

What is the reason for this?

For a long time, various spheres of production life developed at different rates. For example, as compared to 1962 when the first research was conducted, the availability of technical equipment and the level of technology in the majority of branches had advanced, but one cannot say this

about the social and socio-psychological development of many collectives. This disparity was apparently unavoidable. But now it can and should be surmounted, and this is only emphasized by the appearance of a new generation of workers—who are more developed and demanding.

At the same enterprise where we conducted the questionnaire, the desire of young workers to prove themselves in the eyes of those around them and their desire to satisfy their fairly developed demands were interpreted as a limitation of the possibilities of manifesting themselves as individuals. As a result, their most important vital interests are crowded out of the sphere of labor into other spheres, which largely predetermines the appearance of problems of the "temporary person." About 40 percent of the young workers we questioned feel or consciously consider themselves to be temporary people at the enterprise. They do not have a desire to improve their occupational skills or to master a speciality. It is precisely this, and not poor training, that is the main reason for the difficulties in production adaptation, the poor discipline, the lack of initiative and the lack of independence in work. This is predictable: temporary and alien are similar concepts.

It was an unpleasant surprise for us that certain foreman and mentors see these problems in an incorrect light: they perceive the inadequate motivation and the impossibility of finding in labor those aspects that would satisfy man's deeper needs as a shortage of skills and an inability to work.

Frequently young workers and section managers simply do not understand one another. This is shown by the answers of both groups to the question about the main problems of youth at the enterprise. Most of the senior workers (60 percent of those questioned) were bothered by the shortcomings of the newcomer as a worker, and then by the complexities of organizing the working position (providing machine tools, instruments and fittings) that is, organizational and technical problems. They sharply disassociate from this the statements of the young workers themselves: nobody considers his professional training to be inadequate, and many more of them are bothered, on the one hand, by the climate in the collective, the confidence and respect for them and, on the other hand, by the earnings. Of course, the results of an investigation of only one enterprise do not make it possible to make generalizations, but we are announcing them in order for others to check them in their collectives.

The responses of young people revealed another curious contradiction. They complained neither about any serious difficulties in mastering the speciality nor about the provision with instruments and fittings or other complexities of this kind—and in reality there is justification for such complaints!

Journalist: Is this really possible?

N. Yu. Shcherbakov: Only in one case--when people are indifferent to their labor. It is known that many (justifiably) write about the activity of youth and their interest in labor. This tendency which is general in published material augments our observations which need interpretation. It is known that certain graduates of vocational and technical schools do not relate their destiny either to the plant or even to the speciality they have acquired. The areas of life that are interesting and significant to them are in no way related to either the one or the other, and problems of their "home" enterprise do not concern them--they simply do not consider them to be their own problems.

Under these conditions the production organizers at the plant do not manifest sufficient flexibility. Instead of devoting more attention to problems of the individual and contributing to instilling a sense of involvement of the boys and girls in the plant affairs, they limit themselves to tedious (in the unanimous opinion of the young people) tutorship, appeal to their conscience, abuse their duties with references to the production need (usually limited to the framework of the shop), and endlessly repeat: "It is necessary!"

Journalist: You, Nikolay Yur'yevich, gave an unflattering view just now about attempts to educate by referring to situations that arise in the shop and the working position. But is this really bad? It is known that the best education comes from experience. And is it not natural to turn to production situations--after all, they show the young worker most clearly why it is necessary to have a positive attitude toward labor and what a different approach leads to.

#### Organization of Labor--This is Also Education

N. Yu. Shcherbakov: Yes, education through experience is the most effective. But it happens that words--about experience, about the production need, about discipline, duty and many other things--are backed up by nothing other than an inspiring tone of voice.

Imagine a situation, perhaps a not altogether typical one, but still not so rare. For instance, a young person is told: by the first of the month--even if you have to sweat blood--the batch of parts must be ready. But he knows if he does everything he is supposed to the parts he has worked can remain in the warehouse for an undetermined period of time. He also knows that if the work is not done satisfactorily, in an emergency situation, they will look the other way. What do you think? What kind of qualities are developed by such a production situation?

Journalist: And if one were to assume the opposite: the person knows that his work is really necessary, that he will receive a remuneration--both moral and material. In this case, it would seem that the situation should work in the interests of production and education. But in reality this is apparently not always the case?



N. Yu. Shcherbakov: This is true--even in ideal conditions the mechanism of education through experience sometimes operates without effect. And this happens when a certain stockpile of negative experience has been accumulated from above, and it is not necessarily one's own personal experience, on the basis of which a negative psychological situation has been formed, which has its effect regardless of the situation that has arisen in each particular instance. Labor behavior cannot be reduced to the totality of simple reflexes to one external influence or another. When a habit has been formed it is difficult to break. Just as a good worker cannot work poorly, a poor worker, even under the most favorable conditions, because of inertia, will not work well for long if he has not been taught to work well. Therefore one cannot expect an immediate effect from an innovation in production--it is necessary to have patience and consistency in order to rectify the situation. And here one must speak about essential improvement in the organization and stimulation of labor and mastery of the art of administration in which administration, technical processes and people must merge into one.

V. A. Yadov: One must say that I as a sociologist am optimistic about certain tendencies that have traditionally been considered negative although perhaps it will be difficult to explain this. In this connection let us turn to the second of the two major conclusions from our research. It pertains to the growth of, as we say, self-regulation in the behavior of the workers. This process is manifested contradictorily. There are more efficiency experts and fewer who fulfill output norm. But certain undesirable processes are also observed here--for example, the proportion of overfulfilled output norms decreases and there is high turnover of personnel, and increased absence and tardiness. And all this certainly cannot but cause concern, the overall situation seems favorable to me.

Journalist: Why?

V. A. Yadov: On the whole the process of self-regulation means that the workers, especially young ones, are developing a healthy critical basis, that they are taking a more exacting attitude toward the organization of labor, toward the methods and style of management and toward the quality of work--and not only that of management, but also their own. In production life they are becoming more self-sufficient, independent and rational. So in essence they are strengthening the qualities that are necessary for the workers to have a positive influence on production relations and which contribute to active participation in administration. Therefore the development of self-regulation shows not only certain difficulties, but also the increasing possibilities of successfully surmounting them. It would be wrong to think that movement toward a better future is without problems and conflicts. This does not happen either in large or in small collectives, not to mention the society as a whole. Our ideal presupposes not the lack of contradictions, but the ability to note them promptly, foresee them and effectively resolve them.

Journalist: In that case explain, please, in greater detail why, in addition to such, in your words, hopeful processes, we have still not eliminated such phenomena which are intolerable for our society as, for example, violation of discipline?

V. A. Yadov: At certain enterprises there actually are more cases of absenteeism, tardiness and failure to fulfill assignments. But to some extent this is a complex phenomenon. Organizational disorder is also at fault here. One should pay attention to the fact that discipline is not violated indiscriminately--at the end of the quarter when it is necessary to "save" the plan, the number of clearly inexcusable absences decreases sharply. Why does discipline deteriorate at the end of the quarter? Because its observance seems pointless: it is incomprehensible why one should try when the regular rush period is ahead in any case.

Another example--labor turnover. Here too behind the overall tendency lie important distinctions which are related primarily to the nature of labor and the age of the workers. From 1962 through 1976 the proportion of people who had worked at the enterprise for more than ten years by the time of the investigation had decreased: among the workers in heavy physical labor--from 30 to 7 percent, and among machine tool workers--from 60 to 40 percent. The turnover increased in both occupational groups, but in the latter the better and more prestigious labor still keeps many from changing their place of work. Differences related to age are also great. Youth change their jobs much more frequently and are not afraid of changing specialities, which was previously very rare.

Journalist: The question arises: how does one make self-regulation a more creative force? Why, for instance, do present forms of worker participation in socialist competition not always provide an acceptable solution to this problem?

A. N. Alekseyev: To no small degree this is because we have still not eliminated the perfunctory approach to the matter. It is not new that this is inappropriate in any matter, but is especially destructive in competition.

The proportion of those participating in socialist competition has approached the 100-percent limit in recent years. True, it has turned out that the foremen who were questioned at the enterprises that were investigated said that 90 percent of the people participated in the competition, but the workers themselves think that this percentage is considerably less.

It is understandable that perfunctoriness in the organization of competition is reflected very seriously in the attitude of youth toward labor. In the article entitled "The Teachings of Karl Marx and Several Questions of Socialist Construction in the USSR" (KOMMUNIST, 1983 No 3), Yu. V. Andropov writes: "Improvement of our democracy requires elimination of

bureaucratic 'super organization' and formalism--everything that stifles and undermines the initiative of the masses and restrains creative thought and the vital business of the workers. We have fought against such phenomena and we shall fight against them with even greater energy and persistence."

What goal should the competition serve primarily? Increasing efficiency and improving the quality of work. Material stimuli, improvement of conditions and scientific organization of labor, the introduction of new technical equipment, the participation of workers in administration and so forth should be directed toward this. And all these social regulators should, by organically augmenting one another, serve a unified major goal. So it is not the organization of competition as such and not any other aspect of administration in and of itself, but the coordinated functioning that is of decisive significance. Only on this basis is it possible to control effectively and, consequently, to produce a directed and effective influence on attitudes toward labor.

Journalist: What kind of influence does the existing system of administration exert on the attitude toward labor? It is probably not exhausted by those facts which were discussed above?

A. N. Alekseyev: Undoubtedly, this influence is extremely multifaceted. Let us take the issue above which Comrade Yu. V. Andropov, at the June (1983) Plenum of the CPSU Central Committee said this: "It is of exceptional importance for words to coincide with deeds, and for the essence of the matter not to be replaced by form." And if words and deeds diverge in certain cases? Then there is a stratification of the norms for social behavior. The latter can be given to the individual either in the form of verbal formulations of obligations--"how one should act" (norm-requirements), or directly in the norms of mass behavior--"how it is acceptable to act" (norm-stereotypes). A sociological analysis of the data make it possible to assert that now the latter frequently diverges from the former.

For instance, the norm-requirement envisions maximum development of production initiative. But the mutually effective norm-stereotype is one which, for example, involves the revision of technical output norms at the suggestion of the workers themselves. This leads to a reduction of expenditures for the corresponding work, but if they do not come up with the initiative on time, the revision will be done by the administration and then the workers cannot even count on a "consolation" bonus.

The attitude toward the utilization of production reserves is not less contradictory. The norm-requirement consists in most fully disclosing them, while the norm-stereotype consists in partially concealing them. Yet the reserves are immense. Six out of every ten people who were questioned said that if the earnings corresponded to the labor contribution they could add from 10 to 50 percent to the productivity, and another

tenth of those questioned discussed the possibility of increasing earnings more than five-fold! Of course these self-evaluations cannot be believed literally, but it is clear from them that the masses of workers are convinced that they could work much better.

Among the more universal norms that penetrate all production ties are undoubtedly the social norms relating to the final labor results. Here the norm-requirements are motivation, competence and responsibility. In fact, there are shortcomings here too. Naturally, the youth who find already formed norm-stereotypes assimilate them more easily than they do verbal norm-requirements.

#### Instaed of Good Fantasies--Actual Independence

Journalist: Let us return to the point of departure of our conversation--the insufficiently responsible attitude of some of the youth toward labor. The readers will probably be interested in the changes that can be expected here in the future. One naturally assumes that the spiritual, creative and also material demands of the soviet people will grow. Will the disparity between the demands of youth and the possibilities of satisfying them not also increase as a result of this? And will not the attitude toward labor become increasingly instrumental?

V. A. Yadov: Our society is now going through a quite predictable and normal (in the social sense) stage of development. Today it is wealthy enough to set for itself broad social tasks but it is still not wealthy enough to immediately provide abundance for all citizens. The somewhat naive expectations of past times have been replaced by an understanding that the final goals are still far off and that an essential improvement in well-being is possible only on the basis of one's labor.

I cannot but recall regretfully the fairy tales that were widespread for many years to the effect that every boy and girl, when he grew up and finished school, would necessarily find creative, unusually interesting and pleasant work. And when the boys and girls come to production it turns out that in fact they find difficult daily labor waiting for them, and very many of them find labor in whose content it is difficult to find satisfaction. Moreover, for understandable reasons, as a rule, they are initially given the worst positions and, alas, their wages are not particularly good. And it happens that dealing with reality which violates their idealized conceptions of life forces young people to the other extreme--an indifferent and negligent attitude toward labor.

I am in favor of creativity and involvement and having as many young people as possible who strive for and are capable of the most elevated activity. But any activity requires persistence, patience and denial of many satisfactions, and it does not come without pressure on one's self or self-discipline. The labor of the most eminent scientist, writer or

artist inevitably includes an immense amount of hard work. And what can be said about the less creative professions? In any matter, in addition to the joys of creativity and the flights of inspiration, it is necessary also to have simple, but extremely important qualities such as a love of labor, conscientiousness, internal composure, and the ability to fulfill commitments that are made. None of us, and least of all youth, have enough of these qualities.

Let us think about this most interesting question. How in general did it happen that today in some places we experience a kind of shortage of conscientiousness, responsibility and punctuality? And, in essence, we do not experience a large shortage of initiative and desire for creative boldness?

If we look backwards and interpret the historical and cultural heritage of our people, we will find that socialist industrialization was carried out here under slogans of the development of initiative, innovation and the breakdown of outdated norms (and it could be no other way). And capitalist industrialization took place in quite a different social and moral atmosphere: in the atmosphere of rigid observance of rules established by the master and the strictist labor discipline. It is precisely the capitalist factory and the pressure of the economic "whip" that were factors in instilling American business-like qualities and German punctuality. The victory of the October Revolution in a country with average development of capitalism and subsequent industrialization even during the years of the soviet five-year plans gave a powerful impulse to the development of initiative and creative daring. All this harmonized wonderfully with the Russian style. Business-like qualities and punctuality as features of the national character in this historical situation were formed with difficulty. Moreover these values assumed a unique negative significance. Remember the film "Belorussian Railroad Station"? There the plant director tells the bookkeeper, who insists on following instructions: "I thought that you and I were frontiersmen, that we could move mountains and you?"

Today, when the party is setting the task of intensifying all of public production, business qualities, responsibility, discipline and punctuality, that is, those qualities of character of which there has historically been a "shortage," are becoming the most valuable and absolutely necessary. They are just as important as initiative and a creative approach to the matter.

Consequently, the task consists in, relying on these already formed features of the soviet national character--creativity, initiative and collectivism--beginning a nationwide campaign for instilling qualities, as it were, of the executive complex. It is understandable that appeals alone will do nothing here. It is necessary to have the corresponding organization of labor and production. On the one hand, we cannot ignore the desire

of youth to engage in interesting, creative work. Consequently, it is necessary to proceed along the path of combining occupations and changing labor over in a planned way from simple to relatively complicated. On the other hand it is necessary to stimulate as much as possible self-discipline, self-organization, control and encouragements with money.

Journalist: And what other administrative levers can play a positive role here?

A. N. Alekseyev: Problem of labor and the attitude of youth toward labor, as Vladimir Alekseyevich already said, require a certain basis for a constructive solution. It is my conviction that in the present situation there are two major conditions for changing over to the creation of this: improvement of the economic mechanism, particularly increasing people's motivation for the productivity of their labor, and the development of democratic bases, the creation of prerequisites for more extensive and effective participation of all workers in administration.

Enough experience has already been accumulated to understand the main paths for carrying out these tasks. The correct direction of research is shown by the Shchekino method and brigade autonomous financing, as well as the "Kaluga variant." They have acquired immense notoriety and recognition. It is a more complicated matter to make use of these progressive methods. Shortcomings in planning impede this. It is primary significance to combine effective material stimulation with all-around democratization of production administration and consistent implementation of both.

Journalist: Why are we relying precisely on this?

A. N. Alekseyev: Mainly because one-sided and inconsistent introduction of promising forms of administration distorts their very essence, and, consequently, largely make it possible to realize their useful effect. All these measures contradict, for example, the accepted system of norm setting and payment for labor, the system of planning wages, the number of personnel and other indicators.

What is the major idea, for example, of brigade forms of organization and payment for labor? This is primarily payment for the final results. Then all earnings are usually distributed according to the coefficients of labor participation (KTU), which are distributed by the brigade members themselves. How does one combine the KTU with the wage rate system? Attempts to eliminate the contradictions between them give rise to a cumbersome system of uncoordinated additional bonus payments.

V. A. Yadov: This idea can pertain also to a more fundamental selection. At the level of the most general laws two principally different approaches to administration are singled out. Either the controlling system (for example, the foremen) gives an assignment to the controlled system (the subordinate) and strictly supervises the sequence and method of implementing the process--then the controller himself is in all ways responsible

for the result; or the goal is set and the method of achieving it is selected by the controlled person himself, and he is then responsible for the result if it depends on him.

It is understandable that both paths are actually taken in the economy. It is a question of proportions. And one of the most insistent requirements of modernity is to expand the application of the second approach. It is impossible to combine detailed regulation and persistent control of the activity of enterprises, brigades and workers with orientation toward the final product. It is time to refrain from methods that have proved to be ineffective and unpromising. We are speaking primarily about the objective need to increase participation, direct participation, of the masses in administration. It is difficult not to see the link between all radical problems of the national economy and democratization of production.

The workers already recognize this to a significant degree. The majority of them, judging from questionnaires, consider their participation in administration to be necessary, and in certain issues, in their opinion, the workers should have the decisive word. Now their desire has been actually embodied in the law on labor collectives.

A. N. Alekseyev: And in democratization of production administration it is necessary--I emphasize this again--to have consistency. The same autonomously financed brigades themselves, for example, determine the KTU, that is, the proportion of the labor contribution and, correspondingly, the earnings (sometimes, unfortunately, the extra earnings) of each worker. But the wage fund is a given amount, and its average level is planned for the enterprise. This means that workers democratically decide only how to cut up the piece of the public pie that has previously been allotted to the collective. And if there work merits a larger piece? Or a smaller one? It turns out that the person at one plant who works "even better than the rest" has the same amount as someone at another plant who copes with his work "no worse than the rest." Is this fair? Is it effective? Here the young person begins to think not about better work, but about a better place.

Everything that has been said about the distribution of earnings at the level of the labor collective can be applied in principle to the branch and to any other level. The payment for labor according to the final results, which is consistently developing far and wide, should penetrate all units of the national economy and not be limited to the brigade or rudimentary forms. In order to earn more it is necessary to work more. In order to have more nice things and services, it is necessary to produce more and better. Consequently, additional well-being is possible only on the basis of more productive labor on the part of each of us. This was discussed very precisely by Yu. V. Andropov in a meeting with the Moscow machine tool builders: "As they say, there are no miracles on earth. You yourselves understand that the state can provide exactly as many goods as are produced. Increased wages, if they are not accompanied by commodities that are necessary and good and if, finally, the sphere



of services is unsatisfactory, cannot produce any real increase in material well-being.\*

Material stimulation should be based on the principle: the more (less) you have done--the more (less) you receive. But in fact this principle is not always observed, which is fairly frequently discussed by the central newspapers. And it does not have a positive effect on the attitude of youth toward labor either.

The problem is to create a "circle of stimulation." The additional rubles should be a response to additional produced products, and the young person should see that additional efforts produce additional income. There are very many problems here, including unsolved ones. But experience shows that this requirement is met more easily if the workers largely make the decisions themselves: how to fulfill the plan to distribute earnings... Although, of course, I repeat that not everything here is so simple. It is naive to think that the management always sees everything, and can and will weigh everything precisely. And if, for instance, you and I are working in one brigade and we divide the remuneration among us, the division will hardly be of advantage to the one who has worked less satisfactorily.

Journalist: But it happens that the division leads to a dispute and it is necessary to seek justice outside the brigade.

A. N. Alekseyev: And I do not say that it is not necessary to guide this process at all. There are indeed difficulties here, including moral and psychological ones. But regulation of the number and composition of autonomously financed collectives and the utilization of objective indicators of the labor contribution (all this, incidentally, is also done better not by the management but by the collective itself), and, finally, the acquisition by the workers of experience in distribution according to the KTU make it possible to find quite acceptable solutions. For youth work in these collectives can be an invaluable school of labor and life. Moreover, when people make clear what and how much they can and will do, and also why they will do it, they are more willing to work, and to a certain degree independently of earnings.

Journalist: We are speaking about extremely serious problems which are not at all child's play. But the juxtaposition of the seriousness of these problems with the fully established fact of the late maturation of the present generations somewhat clouds the issue.

V. A. Yadov: Unjustly. There is also the idea that our youth are not nearly serious enough. Since childhood our future citizens have suffered from inadequate responsibility. Moreover, young people who try to be independent (self-administration in schools, detachments, in youth sections

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\*PRAVDA, 1 February 1983.

in shops) are ready to and wish to take on their share of responsibility, but instead of support, too frequently everything is decided for them.

If we return to what we were discussing at the very beginning--the tendency toward the emergence of an instrumental attitude toward labor--one need not fear this. For labor under socialism is the main means to abundance, civic pride, and high self-esteem of the conscientious worker. How does one understand a communist attitude toward labor? V. I. Lenin, when speaking of this, had in mind the juxtaposition of dependent labor to labor that is free of capitalist exploitation, which is stimulated not only by private interests, but also the interests of the entire society. Today science is inclined to interpret a communist attitude toward labor as completely voluntary and selfless labor, that is, to relate it not to the dependent labor in a capitalist factory, but to socialist labor. And is this correct? Can one say that the necessary material prerequisites have already been created for this?

It is precisely a socialist attitude toward labor as to a matter of honor, dignity, civic responsibility and a source of material and moral well-being--this is what is required now if one looks at things realistically, without rose-colored glasses. Expansion of the range of instrumental functions of labor and its enrichment as a multifaceted means of achieving the aforementioned goals in life--this is also the path to the establishment of communist labor as a self-valuable activity which is free of external, primarily economic interests, and the transformation of labor into a habit for the healthy human organism.

It is precisely the present matter, which makes serious demands and at the same time gives satisfaction and response, that can have a good influence on young people, give them a sense of being party to common concerns, instill in them a sense of responsibility to themselves and to other people, help them find meaning in life and, in brief, make them adults.

And what if no work can do this?!

The party is constantly concerned about the younger generation, on whose shoulders responsibility for the fate of the society will lie in future decades. The task of party organizations and the Komsomol is to enlist youth more extensively in socio-political activity, educate them in the spirit of devotion to communist ideals, and instill in them a feeling of pride in their country and a desire to contribute to its flourishing through personal labor. They should instill a love for the USSR Armed Forces and strengthen the readiness to defend the socialist homeland. They should devote unwavering attention to all social groups and age categories of youth--workers and kolkhoz youth, students and army youth, and they should fully take into account their peculiarities. The life of

Komsomol organizations should be filled with a large amount of social content, and manifestations of disorganization and sensationalism should be eliminated.

From the decree of the July (1983) Plenum of the CPSU Central Committee, "Crucial Problems of Ideological and Mass-Political Work of the Party."

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## RESPONSES TO ARTICLE ON MATURING OF SOVIET ECONOMY

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 83 (signed to press 13 July 1983) pp 129-137

[For referent item see JPRS 83340, 26 April 1983, No 1050 of this series pp 43-50]

### With One Director at the Command Post

[Article by S. M. Zverev, general director of the Ob' Footwear Association, candidate of economic sciences (Novosibirsk)]

[Text] At light industry enterprises the functions of the economic service have long been performed by the head bookkeeper. Why was this possible?

For light industry it has always been typical to have above-normative stocks of raw material resources. For example, the supply of leather raw material at the beginning of the 1970's was equal to a 6-month demand for it. The normatives for the utilization of material resources per unit of final output included significant reserves. The branch typically had a high output-capital ratio, which was brought about particularly by the prices for technological equipment and material which were lower than they are now (textiles, chrome, leather and so forth). The level of accounting was low and there was no operational information regarding the elements of economic analysis. The administrative staff had an inadequate level of education.

At the end of the 1950's certain large enterprises introduced the position of head economist. But no official instructions were developed for him. The structure and functions of the economic service itself were not defined. Of course this did not contribute to its development and authority. The result of half measure was doubt about the expediency of a head economist at light industry enterprises. It is no wonder that in some places even in the 1970's this job was eliminated.

In the past 10 years the situation in the branch has changed radically. A need was recognized to economize on large and small items, and to use raw material efficiently, especially agricultural raw material--it constitutes more than half of all the raw material received in light industry. The material-intensiveness of the models decreased and continues to decrease. With the

development of the chemical industry it became possible to replace certain natural materials with artificial ones. There was a critical question of more effective utilization of technical equipment, the prices for which had increased sharply. Thus percussive cutting and chopping equipment was replaced by hydraulic equipment. With the same productive capacity, the prices increased 7-fold.

The application of computer equipment opened up new possibilities in administration of the enterprises.

The increased labor productivity, the more complicated equipment, the improved quality and the expanded assortment--all this complicated the administration of production and the collective. For example, in our association the average annual productivity of a worker in rubles increased by 50 percent. Social problems became crucial: it was necessary to increase the incentive funds for the construction of housing, medical dispensaries, kindergartens and so forth.

Everything that has been said also influences the role of the head economist--the deputy director for economics. In my opinion it should be quite simple: on a level with the director he should bear full responsibility for the economic condition of the enterprise. There is no doubt that the qualifications of modern engineers-economists should correspond to this requirement. Above all they should be professionally trained to make competent decisions in the area of production, master economic and mathematical methods, and be able to produce economic analyses both on the basis of statistics and on the basis of prognoses.

Unfortunately, light industry enterprises receive practically none of these specialists. Hence the dissatisfaction of the managers with the level of economic work and the immense unutilized internal reserves. Hence, it seems, also the frequent complaints of economists that the managers of the enterprises do not support them, make decisions in spite of their opinion, and in general do not deal with economics enough.

In this connection there frequently arises a situation of "different interpretations," different understandings of the same production aspects, by the director and the head economist. For example, in individual cases the manager has been forced to make a decision in spite of the technical and industrial financial plan, replacing material and introducing a new subdivision or administrative unit, which worsens the indicators of economic work. When making a decision he "weighs" the prospects and thinks about the fact that by losing a ruble of profit today he will avoid losing hundreds of thousands of rubles tomorrow which, unfortunately, the head economist does not always understand.

It is wrong to think that the directors do not deal with economics enough. At least I have not met any of these. From my own experience as a general director for more than 8 years I know, for example, that questions of profit are always primary for the director, and if the manager and collective leave something out this immediately becomes known in the rayon, city or oblast Gosbank offices, financial agencies and higher organizations. If the enterprise is unable to pay this elicits a responsive reaction on the part of suppliers, the fulfillment of whose plan depends on prompt payment for deliveries. In order to avoid such situations the director is sometimes forced to make decisions that seem

contradictory to workers of individual services. But the task of the head economist, it seems to me, is to go beyond the narrow functional framework and think on a broader and further-reaching scale; taking into account supply and demand, he should develop new decisions. A great deal of attention should be devoted to the economic service of the collective as well.

Thus the tasks that should be carried out by the economist of the enterprise, in my opinion, include the following:

efficient utilization of materials with optimal output (assortment, quantity, sizes, kinds, colors, seasonality and so forth) of the prepared product;

specialization and deepening of specialization;

centralization of individual productions within the association;

prediction on the basis of statistic from preceding periods.

Of course, one cannot but note that in recent years the volume of information that is processed has increased considerably without changes in the staffs of the economic services of the enterprises. Thus beginning in 1981 the load on economists of the Ob' association increased by approximately 30 percent.

The work of the economists of the enterprises depends largely on the activity of the economic services of the branches. Intensification of the economy makes it incumbent on the staffs of the branches to search continuously for better variants of the utilization of raw material, labor, energy and other resources. But here there is not even a division that engages in coordination of the work of economic services of industrial and production associations and individual enterprises. This is the only way to explain the existence of enterprises that chronically operate at a loss, the unjustified output of products made of individual materials (the obvious overproduction of footwear made of floverlak), the lack of study of sales and the real demand for footwear, taking into account climatic peculiarities, for example in products for the North, and so forth. Even today it is clear that the economic unit in the system of the ministries needs improvement. The delegation of these functions to planning and economic administrations is not justified in practice.

I shall give an example. The greatest savings is achieved in light industry as a result of efficient utilization of material. But this purely economic issue is handled for some reason by the technical division which is in no way related to the planning and economics division. And everyone dabbles, intuitively, in economics. We do not experience economic research at this level. Thus in the country only our ministry is producing leather materials. And not all of them go for consumer goods--a good deal of high-quality leather goes to other branches of the national economy for manufacturing small parts, for example, cuffs. But these can be made from wastes from our production! The savings, and this means also the advantage for the national economy, would be significant in this case. This would help to carry out the instruction of the November (1982) Plenum of the CPSU Central Committee concerning a thirty attitude toward the public good.

I shall give a brief summary. The article by I. I. Usacheva, in my opinion, is timely and crucial. I would like for the discussion of it on the pages of EKO to accelerate the solution to problems related to the group of responsibilities and the position of the economic service of the enterprise, and for this to contribute to increasing the role of economic work in the branch.

#### The Role and Significance of the Plant Economist

[Article by R. Ya. Beresneva, deputy director for economics of the Kharkov Plant for Medical Plastics and Stomatological Materials]

[Text] Before the changeover to the new conditions of planning and economic stimulation, economists of the enterprise performed mainly planning and accounting functions. But the wave of research and transformations that embrace the economic activity of all enterprises in the country swept them up in the stream of experiment and holds them up to the present time.

In 1981 we introduced a comprehensive system for the organization of production, labor, administration and wages following the experience of the Volga automotive plant. How did the work for this introduction proceed?

The role of the higher organizations is to study the order and approve a plan of measures, and then to supervise what is being done and how. The entire complex of work was on the shoulders of the plant economic services, divisions for labor and wages and, partially, planning and economic services. Now it is difficult even to enumerate the obstacles and psychological barriers that had to be surmounted before we began to operate in the new way. But were the economists really relieved of their customary functions at that time? No. Of course, we were well supported by the party organization and the administration. This means that the economists could do a good deal if they were promptly assisted. I am firmly convinced of this.

In 1981 calculations were made of the overall labor-intensiveness per unit of output. It was necessary to recalculate the actual labor-intensiveness over several years. This is an entire research project! It is interesting that again the load was larger than usual . . . it is clear that in the future we will not be able to do without this--nonplanned--work. It is necessary, for example, to develop single recommendations and provisions, and this is interesting to us plant economists. But, unfortunately, the higher agencies, the local organizations and frequently even the plant administration do not take into account our overloading, and the potential of economic experience and knowledge is utilized inefficiently.

Thus in recent years local authority agencies have been turning to us much more frequently and, it seems to me, they have largely begun to replace economic and even statistical agencies. They literally flood the plants with assignments under the "Comprehensive Program for Scientific and Technical Progress and Socio-Economic Development" for the five-year plan, and demand reports for the past five-year plan and analysis of indicators for which there is frequently no statistical accountability. For example, since August 1981 we have been drawing up the program for the 11th Five-Year Plan without



approved control figures. It is clear that this work was worthless, but several variants were created, and this involved entire books: recently it was also demanded that we do an analysis of the intensification of production from 1975 through 1982 which, in addition to the usual indicators, included the following: material expenditures per 1 ruble of output; expenditures of fuel and energy per 1 ruble of output; and the proportion of the active part of fixed capital. Each quarter we compile a "chart of the effectiveness of production and technical development of the enterprise." It includes 62 indicators! Additionally, there is the report on the fulfillment of the "Comprehensive Program for Raising the Technical Level and Increasing the Effectiveness of Production" which consists of 168 indicators.

The economists have no time left for in-depth analysis of the operation of the enterprise, and they almost never visit the shops. Unfortunately, today they are engaged mainly in trivial current affairs: how to manage to fill the gap, fill the orders, dispatch them, send them, turn them over . . . The interest in economics on the part of local agencies, their desire to keep up with concrete matters and figures, of course, is laudable. But the load on the plant economists must be lightened.

I read somewhere that the famous brigade leader V. P. Serikov assigned an economist to his autonomously financed brigade, and we intend to keep him--for he is one of the administrative personnel! Incidentally, this notorious division of engineering and technical personnel and employees into administrative personnel and not administrative personnel causes the state as a whole to lose, and not to gain. Just think: the avalanche of accounting and economic work is growing, norm setting is being perfected, there is a process of the introduction of autonomous financing everywhere, and we are reducing the number of bookkeepers, economists and norm setters. We are simultaneously increasing the number of technologists and designers, transforming many of them into ordinary pencil pushers. Why take money from one pocket and put it into another? This will not increase the amount.

One of the central aspects of the problem under consideration is the existence in each plant, even a small one, of a person who is in charge of the division of labor and wages and the planning and economic division, a finance group, and a laboratory for economic analysis or at least a group of 2 or 3 people. And whether he should be called the deputy director for economic problems or the head economist, it seems to me, depends on the enterprise. Naturally, it is desirable to have the same structure for the same types of enterprises. But, unfortunately, this frequently depends on objective circumstances, for example, on the personality of the manager of the plant, service or division.

At our plant the deputy director for economics is in charge of the division of labor and the planning and economics division, and methodologically--the finance group and the bookkeeper. The deputy director is in charge of all economic indicators. He supervises the fulfillment of the plan for the entire list and for each indicator of labor, production cost and profit. He even regulates the hiring of personnel (depending on the limit). All additional expenditures, deviations from planned prices, replacement of raw material, contracts for service and so forth are coordinated with him. I am convinced

that only an economist who has his finger on the pulse of all the plant's economic activity can apply a correct strategy and tactics with constantly changing factors. And if he does not know something (if he has missed something or was not made aware of it), this will influence the results of the work of the entire plant.

The position of the head economist makes it necessary for him to keep up not only with economic and production problems, but also technical ones.

For example, we have sharp fluctuations in orders and, consequently, in the production plan for stomatological items. Every 5 years the output of certain items decreases, and then it increases fairly sharply again. What should be done with skilled personnel who are not fully employed today, but next year will work overtime, since there is no limit on numbers for increased labor-intensiveness? Reduce the number of them? But, in the first place, we cannot reduce the number of people every 5 years. In the second place, where will we obtain the limits and people tomorrow if there is a shortage of personnel? How will we manage to train them (the training times are from 3 to 6 months)--after all, the plan will not wait? Someone must think about and foresee all this, and coordinate the indicators of today and tomorrow. Only the head economist is capable of doing this because he has all the combined data for labor, wages, production costs and production volumes.

In 1975 the central plant laboratory and the design division of our plant developed a new item to replace an obsolete one. Its labor-intensiveness doubled, and in certain operations it even increased 4-fold. Taking into account the fact that since 1976 the output of the new items has doubled, we have had to employ an additional 300 people in manual labor. But where are we to find them with the existing shortage of personnel? And who will plan for us a reduction in labor productivity of 12 percent? The economists could not sit with their hands folded. We made calculation after calculation, demonstrating and warning ahead of time where the collective would be going. This produced a certain impression and the plant efficiency experts were able to mechanize certain processes. After setting the plan for the introduction of the BIRZ we correspondingly extended it to the plan for the production of the new item.

In my opinion, the head economist is both a methodologist for economics and an advisor for the administration, but he is not a consultant, but a person who bears complete responsibility for the level of the economy of the enterprise. Of course this is only if his word is law for the director, regardless of how paradoxical this may seem. And there are situations in which he must prove and insist on his own stance. For administrators who are nearby this might seem offensive and inexplicable. If their pride is wounded (who is the commander here?!), there may be no advantage. In these cases the head economist, depending on his nature, either leaves or becomes a compiler of all kinds of references.

The economic service implements the state plan, providing the thread that joins the Gosplan to the brigade. Of course, in order to carry out these functions the economists themselves must be on a level to meet these requirements.

It would be good for the plant economist to be legally established, or at least he should not be embarrassed to turn to a lawyer more frequently so as not to make terrible mistakes. Our work requires not only high professionalism, but also courage. It is necessary to penetrate into the holy of holies in other services, to bring somebody's shortcomings to light, to search for and find reasons for inefficiency and to make suggestions for eliminating them. Not everyone, unfortunately, will enter into situations of conflict, not everyone will bring out the dirty laundry, and in either case if the economist does not have support from the administration and the party organization, the next time he will bypass inefficiency, he will not take note of it, or he will notice it and not say anything. This is why so much depends on whether or not the word of the economist is heard and whether he is supported. I would even say that if an economist is not heard, he is a bad worker and is not carrying out his real duties.

Relations between plant economists and the all-union production association and the ministry form in various ways. A good deal depends on the qualifications of the higher workers, on whether or not they place on the shoulders of the lower level work which they are supposed to do themselves. For some reason up to this point in the branch we have not become accustomed to the idea that the fulfillment of the plan should be regarded as a cumulative total from the beginning of the year or from the beginning of the five-year plan. We are asked to fulfill quarterly or monthly plans. What freedom of economic maneuvering can there be here!

Branch economists still plan all indicators for us from the level that has been reached, without analyzing the cost at which we have achieved fulfillment today and at what expense. It might be at the expense of new capital investments and the assimilation of capacities or because of improvement in norm setting, labor organization and so forth. And it turns out that the person who has worked with excellence yesterday slows down today because he has invested and utilized all his reserves. Just try to show: in 1980 and 1981 we achieved a growth in the production volume of 10 and 21 percent (and almost the same growth in labor productivity, respectively) mainly as a result of the introduction of the VAZ system and collective forms of labor organization, but the fixed capital did not increase, the level of technically substantiated norms reached 90 percent, and without technical re-equipment further progress is impossible. And yet the neighboring plant has free capacities and the percentage of technically substantiated norms is only 35 percent. But still they assign the same growth rate to us and place us on a level with our neighbor. Here is something for branch economists to work on and produce a real analysis! The level of planning and of all economic work depends to a large degree on the restructuring of their activity.

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## TIGHTER CONTROLS OVER SUPPLY, DELIVERY URGED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 83 (signed to press 13 July 1983) pp 138-143

[Article by Ye. S. Sobolev, candidate of economic sciences, deputy general director for economic problems of the "Khar'kovskiy elektromekhanicheskiy zavod" production association: "Contractual Commitments: It is Time to Introduce Order"]

[Text] During the years that have passed since the 23rd CPSU Congress and the September (1965) Plenum of the CPSU Central Committee the scale of the Soviet economy has increased. It has been necessary to restructure the work of industrial enterprises and to further improve organizational forms of administration of production and the enterprise as a whole. According to the provisions on the socialist state production enterprise, its rights have been expanded, there has been a changeover to a 2- and 3-level administrative system, and production associations are being organized.

But the solution to the problems of improving the economic mechanism cannot be limited to the enterprises alone.

Let us consider, for example, those difficulties that arise in the Khar'kovskiy elektromekhanicheskiy zavod production association, one of the leading enterprises of the electrical equipment branch of industry. It specializes in the production of large electrical machines, electric loading engines, electric engines with direct and alternating current of up to 100 kilowatts, thyristor convertors, automatic switches, contactors, consumer goods and so forth. About 100,000 types of various kinds of electrical equipment are produced each year, 60 percent of which is produced individually. The products of the association are delivered to practically all branches of the national economy, including to enterprises of the metallurgical, coal, mining, petroleum extraction and energy industry. From 9 to 12 percent of the products are exported. Each year the association concludes 7,000 agreements with consumer plants.

Since 1978 the work of the collective has been evaluated according to the results of the fulfillment of contractual commitments for the delivery of products. During the years of the 10th Five-Year Plan the association took measures to strengthen contractual discipline for deliveries and to improve the planning and organization of the fulfillment of contractual commitments for the entire list of products that are produced within the given time periods.

The changeover to the new evaluation of the work under the conditions of an enterprise that produces as many products as the KHEMZ production association required serious restructuring involving the formation of a portfolio of orders, its material support and the organization of production. To this end a system was developed for planning the main production which envisions the coordination of the load on the plant with the main technical and economic indicators and the fulfillment of contractual commitments. Special attention was devoted to comprehensive interconnection of the production plan, its preparation and material and technical support, and the continuity of operational calendar planning, taking into account the peculiarities of production for each group of items on the list. Computer equipment was utilized extensively.

A new policy has been adopted for informing the shops of the volume indicators and the products list, according to which the planning and economics division of the association establishes the quarterly plan for the production shops with a break down for the month, and a list of concrete orders is appended which indicates how they fit in to the established production volume. The level of economic work has risen in the shops of the association, for which the organizational structure of the shop economic services has been revised. Training of economists in planning methods has been organized in courses for increasing qualifications.

As a result of all this there has been a considerable improvement in the work for fulfilling contractual deliveries. During 1978-1981 the number of failures to deliver products under concluded agreements decreased to less than one-third the former level. Losses from fines for failure to carry out deliveries of products under contractual commitments decreased by 34.5 percent. The collective of the association fulfilled the state plan in 1981 for all technical and economic indicators. It sold 646,000 rubles' worth of products in excess of the plan. The increase in the volume of commercial output amounted to 8.2 percent by 1980. All of it was achieved as a result of increasing labor productivity.

The association also fulfilled the 1982 plan. The growth rate of the production volume was 6.7 percent. For certain profiled kinds of products even higher rates were achieved. All kinds of electrical equipment were delivered promptly to the most important startup projects for energy engineering, metallurgy, the coal and other branches of the national economy. This required hard work on the part of the collective, but still one cannot speak of stability in the operation of the association. Why?

As practice shows, improvement in economic work at enterprises without solving related problems at the level of central and branch agencies (USSR Gosplan, USSR Gossnab, the ministries) does not produce the proper effect.

The key issue in economic work is giving the enterprises the production plan that has been developed on the basis of engineering and economic calculations and balanced with material and technical support. But, as in preceding years, the production plan for 1981-1982 that was assigned to the association, in terms of a whole series of materials and batching items was unbalanced with material and technical resources that are distributed by the USSR Ministry of

the Electrical Equipment Industry and Gosstab. The enterprise itself had to provide funds for the production plan. If one takes into account that we receive about 120,000 kinds of batching items, raw materials and processed materials from 760 supply plants of various branches of industry, it turns out that in order to fulfill the state plan we have to do the work of USSR Gosstab agencies. Moreover, they are very late in considering questions of supplying the association with materials and batching items. As a rule, the territorial administrations for material and technical supply review the association's need for the current year in January of the current year, and the Ukrainian SSR Gosstab--in February, and the final decision concerning material and technical supply is made in the ministry and the USSR Gosstab no earlier than April-May of the current year. And decisions regarding a number of important parts of the plan are not made until even later. The enterprises must use their own forces and any means to provide for fulfillment of the state plan. This was the situation, for example, in 1981 when the association failed to deliver prepared products while they were waiting for timber materials and corrugated cardboard for packaging.

The existence of a complicated and multilevel system of material and technical supply practically removes responsibility from agencies of the Gosstab and the ministries for prompt fulfillment of these functions. The ministry is not responsible because it issues unattached capital, and the Gosstab agencies--because they are not responsible for fulfillment of the enterprise's production plan. And the work of the USSR Gosstab organizations is evaluated according to their own indicators, which do not take into account that they are to blame for the fact that dozens of enterprises are not fulfilling the production plan.

Under the conditions of the evaluation of the activity of enterprises in terms of the fulfillment of contractual commitments, an important role is played by prompt delivery of prepared products to the client. Our association delivers products along all the lines of the country's railroads. And we experience serious difficulties here. Railroad workers will accept products for delivery only if they fill up a car going in one direction. But in the association 35 percent of the overall volume of products are delivered to the consumers in small batches, that is, nontransit norms are created. As a result, products that are manufactured in time lie in the warehouse of the enterprise waiting until a full car can be sent in one direction or another.

Territorial material and technical supply agencies of the USSR Gosstab are responsible, under agreements with the clients, for receiving from the supplier plants that are in the region of operation of these agencies products for a specific purpose in quantities that are less than the minimum transit norms and sending them to consumers in other regions if the consumers cannot obtain them from the material and technical supply agencies in the place where they are located. But this requirement is not being fulfilled.

Many problems related to the time periods for submitting supply orders when forming the order book have not been solved. The lack of coordination of time periods for submitting supply orders in the existing "Special Conditions for Product Deliveries," approved by the USSR Gosplan and the State Arbitration Board Under the USSR Council of Ministers, places enterprises and associations



in an extremely difficult position. This pertains especially to enterprises with many kinds of products and with an individual nature of production that produce complicated and especially complicated products, like ours, for example.

Every enterprise when forming the order book and submitting supply orders is guided by the "Special Conditions for Product Deliveries" of its branch, and therefore in a number of cases the deadlines for submitting supply orders for obtaining batching equipment are earlier than the ones for manufacturing the item itself. Such an absurd situation leads to failures to make contractual deliveries. Thus the supply orders for automatic switches of the A-3700 series with semiconductor breakers are issued to the association according to the sixth point of the "Special Conditions for Deliveries of Electrical Equipment Products" 45 days before the beginning of the quarter in which they are to be delivered. In order to complete the switches, according to this same document, the association must also order deliveries of semiconductor breakers 45 days before the beginning of the quarter. But according to the "Special Conditions for the Delivery of Electronic Equipment Items," batching items for the production of these breakers are ordered 65-90 days ahead of time . . .

Similar situations arise with the output of large electrical machines, control stations, thyristor convertors and other items of the association. For example, for the manufacture of electric engines of up to 100 kilowatts for maritime use, the supply orders are submitted 75 days before the beginning of the quarter of delivery, and for completing them with control stations produced at Elektrosila --100 days before the beginning of the quarter. Time periods for submitting supply orders have not been coordinated for the manufacture and batching of thyristor convertors which are batched with transformers of the Sverdlovsk Uralelektrotiyazhmash plant.

Problems have not been solved with respect to payment of accounts for products that are sent by enterprises to which USSR Gosbank institutions have applied credit sanctions. According to the decree of the CPSU Central Committee and the USSR Council of Ministers of 12 July 1979, in order to provide for prompt accounts for products delivered in keeping with agreements and to increase the responsibility of purchasers for observance of payment discipline, when the purchaser does not have funds, the payment documents they have signed are paid by the USSR Gosbank through loans. But the instructions developed by the USSR Gosbank and the USSR Stroybank of 14 December 1979, No 245/261 do not solve this problem. Thus during 1980-1981 the Moscow Borets plant did not pay our accounts on time for products that were delivered to it because of the fact that the Moskvoret'sk division of the USSR Gosbank applied credit sanctions to it. As a result we have repeatedly failed to fulfill the plan for product sales. The situation is similar with other USSR Gosbank institutions which have applied credit sanctions to such large consumers of our products as the Novokramatorsk machine building plant, Uralmashzavod, the Moscow Plant imeni M. I. Kalinin and others.

The association, like other enterprises of the country, is faced with the task of more fully and effectively utilizing the production and scientific-technical



potential and introducing new methods of management more quickly. In resolving these issues the most rapid practical implementation of the measures earmarked for improving the economic mechanism will be of essential assistance.

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## DIMINISHING YIELDS OF UST'-BALYK OIL DEPOSITS HIGHLIGHTED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA  
in Russian No 8, Aug 83 (Signed to press 13 July 1983) pp 144-148

[Article by N. M. Nikolayevskiy, winner of USSR State Prize, doctor of economic sciences, All-Union Petroleum and Gas Scientific Research Institute: "A Dispute That Costs Millions"]

[Text] In an article published in EKO, academician A. P. Krylov demonstrates that the overcrowding of the main supply with additional wells is inadmissible: this prematurely reduces the productivity of existing capacities since the interactions of the wells under the conditions of migration of the petroleum, and the water in the layer and the forced water increase.\*

A number of articles in regional and departmental publications suggest mass filling in of the networks of developments with so-called additional wells in order to increase the volumes and effectiveness of extraction.\* They do not take into account or completely deny the phenomenon of interference--excessive removal of layer energy and the removal of petroleum by additional wells from the main supply of the wells.

Such spreading of particular (tested in Ust'-Balyk) and inadequately studied experience means, essentially, abolishing the hydrodynamic part of

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\*See EKO, No 1, 1980.

\*Yanin, Al. N., Yanin, An. N., "The Economic Effectiveness of Capital Investments in Drilling and Building Up Additional Wells at the Ust'-Balyk Petroleum Deposit," PROBLEMY NEFTI I GAZA TYUMENI, Iss. 50, Tyumen, 1981, pp 66-69; Yanin, An. N., "The effectiveness of Regulating the Development of Deposits by Drilling Compression Wells," NEFTYANOYE KHOZYAYSTVO, 1979, No 10, pp 39-43; Muslimov, R. Kh., "Experience in Optimizing the Development of the Romashkinskoye Petroleum Deposit," NEFTYANOYE KHOZYAYSTVO, 1980, No 12, pp 27-34.

the substantiation of plans for the development of petroleum deposits, which were prepared by the All-Union Scientific Research Institute of Petroleum and Giprotymenneftegaz. They were begun in 1964 and in practical implementation under the conditions of Western Siberia proved their great national economic effectiveness.\*

The denial of the interference of simultaneously operating wells of the basic and additional supplies is related to another unsubstantiated recommendation (one of the initial references in the Yanins' idea)--the criterion of the effectiveness of additional wells should be the economic effectiveness of the development of the worst (closed) deposits in the region.

One should take note of the suggestion made by certain petroleum workers to "raise" the mass technology of development to the level dictated by the conditions of "closed" deposits (or groups of them). Yet evaluative data\* that has been published and refuted by nobody shows that such standardization requires a four-eight-fold increase in drilling work in the petroleum deposit with an increase of petroleum extraction of only 1.6 percent.

Regardless of how the conditions for extraction and sale of oil may change, the task of planners, designers, technologists and production workers will always be to achieve a minimum production cost with the given assignments and limitations on resources. It is also clear that with various variants of technologies which are brought about by changes in external conditions (for example, forcing of the planned extraction), the policy for planned drilling should not deviate excessively from the optimal technology for the development of a given deposit.\*

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\*Nikolayevskiy, N.M., "The Role of Sparse Networks of Wells in Increasing the Rates of Assimilation of Petroleum Deposits," NEFTYANOYE KHOZYAYSTVO, 1975, No 12, pp 20-24.

\*Levi, B. I., Dzyuba, V. I., Ponomarev, S. A., Khalimov, E. M., "Research on the Effectiveness of the Development of Petroleum Deposits on the Basis of Economic-Mathematical Modeling," Brochure of the VNIIOENG, survey information, Iss. 21, Moscow, 1982, pp 40-42.

\*See, for example, the article by Voronovskiy, V. R. and Putokhin, V. S., "Economic-Mathematical Substantiation of the Dynamics of the Extraction of Petroleum With the Given Technology for the Development of Petroleum Deposits" in the collection of scientific works of the VNIINEft', Iss. 72, Moscow, 1980, pp 140-149.

Let us consider the actual data for Ust'-Balyk during 1970-1979 which were presented in the Yanins' article. Additionally, we used data from primary reports: the removal of liquid and petroleum, the volumes of water forced into the petroleum layers, capital investments in the initial network of wells (49 hectares per well) and the corresponding industrial buildup.

In order to reveal the main tendencies and dependencies, we conducted an analysis of the absolute and relative values of the indicators during this decade. The results of the calculations are presented in figures 1 and 2. These charts make it possible to evaluate the uniqueness of the development of the field  $S_1-S_5$  (which includes the Ust'-Balyk deposit): the stable reduction of extraction with increased crowding of the network of wells and the use of water under the conditions of intracontour forcing of water; the redistribution of the volumes of extraction between the basic and additional supplies of wells as a result of interference; the disadvantage of the method under consideration of "regulating" the process of extracting petroleum for these fields and so forth.

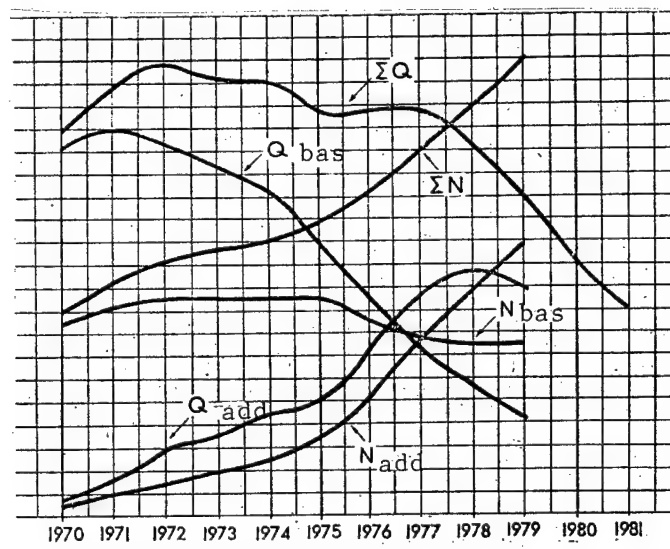


Figure 1. Dynamics of Absolute Indicators of Development of Ust'-Balyk Petroleum Deposit

Key:

$N_{bas}, N_{add}$   $N$  - Number of wells in basic addition and total supplies  
 $Q_{bas}, Q_{add}, Q$  - Annual volume of extraction of petroleum from basic, additional and total supplies of wells

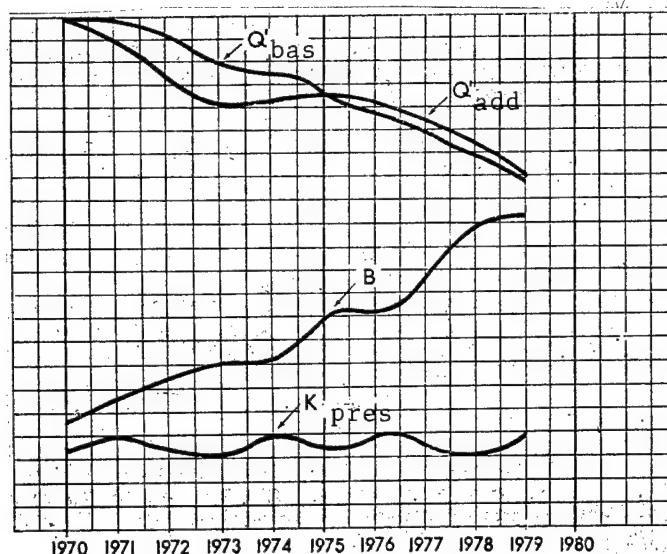


Figure 2. Dynamics of Relative Indicators of Development of Ust'-Balyk Petroleum Deposit

Key:

$Q_{bas}$ ,  $Q_{add}$  - Average daily withdrawal from one well of basic and additional supplies, respectively, tons/day

$B$  - Flooding of wells, percent

$K_{pres}$  - Ratio between pumped water and extracted liquid

What is especially important for evaluating the application of this method to all similar deposits in the region?

The steady growth of the additional supplies of wells accompanied by the fact that their number surpassed the number of wells in the basic supply after 1976 caused a radical redistribution of the layer pressure in Ust'-Balyk and the "suppression" of the main supply of wells that had been drilled on the 49-hectare network.

As early as 1976 there was a balance both in terms of the number of wells and in terms of the volume of petroleum extracted from the wells that are being compared. This fact is objectively proved by the existence of interference of wells of the basic and additional supplies. The effectiveness of the wells of the additional supply is only apparent since it is provided by suppressing the productivity of the wells of the main supply.

There has been a sharp reduction in the productivity of the main supply as a whole and in the average daily yield of individual wells, which is not typical of such networks for development. Moreover, beginning in 1977 there has also been a sharp decline in the total extraction of oil. The unfavorable dynamic is developing against a background in which the additional supply of wells is increasing more rapidly than the main ones,

both absolutely and relatively: there are up to 188 additional wells, not including 54 pressure wells that have been changed to additional wells, as compared to 156 main wells.

It is also important to note the favorable ratio during this decade between the volume of forced water and extraction of liquid ( $K_{\text{pres}}$  is greater than 1.0) and there is also a greater volume of water forced into the layers; during the first five-year plan in which the method was applied (1970-1974) they pumped 94.5 million tons, and during the second (1975-1979)--132.9 million tons.

The fact that the number of wells more than doubled increased capital investments by 110.9 million rubles. According to the plan of the All-Union Scientific Research Institute of Petroleum, in 1964 126 million rubles were invested in the creation of main wells in Ust'-Balyk. Consequently, a total of 237 million rubles have been invested. Moreover, the additional capital investments not only did not provide for increased extraction, but did not provide for stabilization of the extraction at a sufficiently high level for an extended time either.

There is a significant similarity between the dynamics of flooding wells and the coefficient of pressure if one takes into account the difference during one year between curves B and  $K_{\text{pres}}$  in figure 2.

From what has been said one can draw the following conclusions.

The artificial creation of active water pressure conditions for the operation of geologically single deposits (beds), which is typical of Ust'-Balyk, causes general hydrodynamic laws of forcing out liquids (especially when the deposits are "cut up"), which are characterized by interference of the wells. This increases especially sharply when the networks of development are crowded. An analysis of the actual data for Ust'-Balyk confirms this conclusion and refutes the conclusion of proponents of the idea of additional crowding up to the point where there is no interference in the deposits of the construction under consideration ( $S_1-S_5$ ).

When evaluating the actual contribution of additional wells at such deposits it is necessary to take into account the overexpenditure of labor energy and withdrawals from the main supply of wells.

Additional capital investments related to the strategy of additional crowding of the network of wells, in the amount of 110.9 million rubles, could be more usefully assimilated at the petroleum deposit of Western Siberia that is to be put into operation next. The inadequately justified diversion of capital investments which are strictly limited for a long period in the future can have a negative effect not only for the development of the extraction of petroleum in Western Siberia, but also on the development of the fuel and energy complex as a whole. For the funds saved as a result of better technology and better organization of extraction can also be used for finding alternative sources of energy, for the development of energy-saving technologies and so forth.

In Western Siberia, as in any other petroleum and gas bearing region, as the result of complete assimilation of the positive experience that has been accumulated and carefully tested justifications, a policy should be developed for drilling each type of deposit which would provide for the achievement of planned increase in the extraction with minimal expenditures for all of the work. Ignoring the data from science does not contribute to solving this problem.

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#### LACK OF READILY AVAILABLE TECHNICAL INFORMATION DECRIED

Novosibirsk EKO: EKONOMICA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA  
in Russian No 8, Aug 83, (Signed to press 13 July 1983) pp 149-152

[Article by B. S. Vaysberg, senior engineer of the division for technical information of the "Ural'skiy Turbomotornyy Plant imeni K. Ye. Voroshilov" association (Sverdlovsk): "Above the Ural Mountains"]

[Text] Once I was a consultant at an exhibition of the achievements of inventors and efficiency experts in Sverdlovsk Oblast. I was sitting at the "Information" table and a young man with a big moustache came up to me, apparently a southerner. He said:

"Please, sir, give me the brochure for an instrument for cutting small screw threads straight on. It is a good instrument and we will use it."

"Unfortunately, we have no information."

"Ah, what a pity! What about presses for processing radio parts?"

"Alas, we do not have that information either..."

"Well, friend, do you have information about a measuring device for controlling gears? It is a remarkable thing!"

"You are unlucky today--we do not have that brochure either. You yourself understand that it is difficult to deal with paperwork, and we do not manage to print all the brochures..."

Then I suggested that he write down the address of the enterprises he was interested in which had sent exhibits without information that could be given to the visitors. I suggested that he write and ask for the blueprints. I suggested this, but I understand requests are a long and indefinite matter. They might send what you ask for and they might not.

At that same exhibit there were about 600 physical displays. They were excellent, tested and highly productive developments. They represented the advanced technical experience of the Sverdlovsk enterprises. But the literature at the stands (brochures, sheets of information, descriptions) was available for only 100 of the innovations. The consultants had to deny six out of seven requests. We felt awkward, as though we were personally guilty. And perhaps this actually is our fault too--as technical information specialists and propagandists for new technical equipment? For we know better than anybody that the brochure is an important thing. Frequently it replaces blueprints and helps to introduce the invention rapidly.

I recalled that the young foreman Goryachev visited the exhibit for scientific organization of labor. Then he came to us, to the technical information division, and brought a brochure for a holder for a boring machine. It was quickly replaceable, light and very convenient, and it saves a great deal of time. Goryachev asked to order blueprints from the Irbitsk plant, where this holder was invented. We wrote, and then waited and waited. During this time the foreman and his workers, having figured out the construction of the innovation, had drawn sketches. They manufactured two holders and put them into operation. And the blueprints are still on their way, but they have reached no one. There are many cases like this in plant life, one might say every day.

Tired of walking through the exhibition hall, my southern acquaintance returned to me. He hurried up to the table. And he began to complain:

"Oh, there is so little information! And there is so much that would be valuable to take away..."

"What are you going to do!" I responded.

"What are you going to do, you say? Friend, let us think about this together."

He turned out to be a colleague of mine, the chief of the division for technical information of one of the Georgian plants. We sat and thought and resolved this arithmetic problem with unexpected speed.

All of the brochures for the exhibit were published in the same amount--500 copies. There they lay, the master copies, on my table--100 of them, in the form of a file. Incidentally, they were printed on beautiful white, high-quality paper. They were colorful. And for these 100 brochures at the warehouse there were 50,000 sheets of information. Why, actually, were they all published in the same amount? Why were they all treated alike? Is it not obvious that innovations all have, as we say, different zones of dissemination? Consequently, the need for information differs as well.

Here, for example, is a cassette for processing valuable stones. It is a typical innovation for limited application. In Sverdlovsk Oblast there are several jewelers and stone cutting factories. One of them sent this large cassette to the exhibition. Say that throughout the Urals there are ten more enterprises like this, and perhaps 50 in the country. The result is that a maximum of 50 copies of the brochure are needed for this innovation. The other 450 will remain unused and become waste paper.

Here is another innovation--a pneumatic welding instrument. It has a very broad zone of application. Hundreds of enterprises in the oblast and thousands in the country might be interested. But there are only 500 brochures. This is clearly not enough.

"And you know, friend, I just saw a packet of brochures in the wastebasket. They were bound together and thrown away," said the southerner.

"Yes, it happens that a person takes an extra supply of brochures, looks at them attentively, takes what is necessary and actually throws the rest in the wastebasket," I agreed.

The southerner and I divided all 100 innovations for which there were brochures conventionally into three groups, in terms of the popularity of the exhibits and "published" them in various numbers of copies--100, 300 and 600 copies of each kind. The simplest calculation produced a total of more than 30,000 brochure pages. This is compared to 50,000 which lie in the warehouse. There is already a savings! But half of those which remain in the warehouses--alas!--are still unnecessary. Luxurious colorful wastepaper...they say, moreover, that workers who procure secondary raw material will not take brochures that have been thrown away.

In a word, my colleague and I with our first approximate attempts "saved" almost half of the paper that is wasted on brochures. Indeed, with the same volume of paper one could publish not 100, but many more of all kinds of brochures. My guest and I again broke down the exhibits, not into three, but into six groups, and "published" the brochures in varying amounts--from 50 to 600 copies. And we managed to "publish" 200, that is, twice as many brochures. We verified the unexpected results three times. Everything was precise. Then one would have to refuse interested visitors to the exhibit only half as frequently. And half as much paper would be thrown away. And the main thing is that more innovations would be introduced into existence.

Why do we not make these calculations before each regular exhibition? Why do we think only about immediate organizational matters? Is it too much trouble to calculate? It is simpler, of course, to publish these brochures without thinking about whether or not there will be a demand for them. And it is probably easier for the printing house to print them

all in the same amount. It turns out that at the exhibition of innovators we, propagandists of everything that is advanced, turn out to be the backward ones...

"Listen, friend," the southerner laughs, "Thank you for the experience. I shall take these figures home and show them to people. I shall teach them how to publish technical literature correctly."

"It is not clear whose experience this is," I laughed, for the first time not feeling awkward with the persistent guest. "If you manage to do what we have calculated I shall come to observe your practice..."

As I expected, after closing almost half of the brochures remained as a sad memory for the organizers of the exhibit. I saw that mountain of excellent paper that was to be thrown away. The mountain reached approximately to my waist. It was not so much, and there was probably no reason to be sad. Not very much garbage is thrown away completely! I recalled my conversation with the southerner and our calculations. I remembered that there are so many exhibits that go through the Soviet Union! Is this amount of paper wasted in vain?! I imagined this and became frightened: the mountain started to grow and it became higher than the Ural Mountains...

My Georgian colleague would probably say:

"Listen, friend, let us think. Let us calculate this for the entire country. The mountains of waste paper would be as high as our Caucasian Mountains!"

That is even more. It means that it is time to put things in order here.

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## COMPUTER INPUT DEVICES' KEYBOARD DESIGNS EXPLORED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA  
in Russian No 8, Aug 83 (Signed to press 13 July 1983) pp 152-157

[Article by V. G. Balabanov, RUMB Central Scientific Research Institute  
(Leningrad): "Let Us Begin With the Keyboard"]

[Text] Imagine that pianos were produced with various sizes of keyboards, of various colors and located in different places...would the art of the pianist reach its heights under these conditions? Would there be a Svatoslav Richter or a Van Cliburn? One can only guess about all this, but one thing is perhaps clear--the path of the pianists to mastery would be more crooked.

Here is a comparable situation--the preparation of machine bearers of coded information. Here one can give facts and figures that show how much we lose by forcing the large army of operators to work on various types of keyboards that are most frequently not well planned, inconvenient and not very productive.

The typewriter keyboard is one of the main elements of the input device (UPD) for the operator when coding programs and initial information. The UPD keyboard now has various designs, forms, colors and mechanical devices. For example, the length of the space bar on UPD Ye8 keyboards is changing from 115 to 108 millimeters. On the PA80-2/3m keypunch instead of one long space bar there are two: "OP" (one space) and "PP" (repeated spaces) and both of them are located in the zone of the little finger--the weakest finger on the left hand of the operator.

The keyboards of a number of typewriters have two keys for switching the carriage to the upper and lower cases. The keyboard of the PA80-2/3m card-punch and the Zoyentrom-415 have only one key, which is pressed with a finger of the left hand and kept in this position until the symbols located on the upper register are coded.

The frequency of the appearance of figures in the commands in programs for the YeS EVM reaches 35-43 percent, and therefore the operator of the UPD keyboard frequently switches from one register to another. When working with keypunches of the Zoyemtron-415 or PA80-2/3m type, the operator is practically always working with only the right hand, keeping the index finger of the left hand on the VR (upper register) key.

The main requirement for all UPD's is the existence on the keyboard of alphabet and figure symbols and special signs for so-called system composition. The designs for the location of the signs for system composition do not coincide on many keyboards, and some UPD's do not even have designations for control symbols.

The speed and precision of the work of the operators are reduced because keys are located with a shift among the rows. This peculiarity of design of UPD keyboards was borrowed from printing type cases (the distribution of the symbols) and mechanical typewriters (for shifting the keyboards), but in this case all of the fingers of the operators when preparing data for YeS electronic computers perform excessively complicated movements. The most labor-intensive keyboard is that of the PA80-2/3m keypunch.

The aforementioned peculiarities and shortcomings of the keyboards that were analyzed cause 80-90 percent of the breakdowns and mistakes in coding information and numerous difficulties encountered by the operators when assimilating methods of working on the UPD for the YeS electronic computers.

Modern UPD's do not have any organizational equipment, for example stands for line indicators. The operators must place the forms with texts of programs and initial data on the tables next to the keyboards. Because of the inadequate sizes of the forms it is necessary to fold them and place them in positions that are inconvenient for work, as a rule, only on the left side of the keyboard. This causes rapid fatigue and contributes to the development of squinting.

The widely used UPD's do not have places for pencils, pens, rulers or other tools. They are not equipped with means that make it possible to utilize dictaphones, equipment for receiving and transmitting data, background music, individual lighting of the working position, and so forth.

It should also be noted that the work of the operators on the UPD's is accompanied by the performance of a large number of complicated auxiliary actions and maneuvers related to transferring the indicators of the coded lines onto the primary document (form with program), turning on switches, moving carriages of typewriters, pressing buttons, keys and other parts located both on the keyboard and on panels of the control devices. The physical load on the fingers and hands of the operator is not distributed uniformly. And the load is not distributed uniformly on the various kinds of keyboards either. These shortcomings do not make it possible for the operator to use effective methods: ten-finger (touch) typing which is free of overprintings and shifts.

One cannot say that nothing has been done in the area of preparing data for electronic computers. The widely known models of card punches have been improved considerably, new types of UPD's have appeared, but nonetheless in this state manual labor amounts to 85-90 percent. It is not only the imperfection of modern UPD's that has a negative effect on the labor productivity of operators, but also the nature of the data that are fed in. In the 1970's the labor-intensiveness of coding programs for the YeS electronic computers increased two-three-fold because of the essential increase in the length and complexity of the orthographic structure of the commands. All this makes it impossible to code more than eight-ten symbols per second, and the average productivity even of experienced operators amounts to two-three symbols per second.

There is no doubt that the main condition for highly productive work of operators for coding information is an efficient keyboard which is the same for all types of UPD's: in terms of design, sizes, color, mechanical properties and location of the keys. The same condition should be extended to keyboards for registering production and information, equipment for receiving and transmitting data, dialogue panels and subscriber points: for there is no principal difference between the nature of the work of an operator using a computer UPD and devices for receiving, transmitting and registering data in automated control systems. When working on all of these kinds of equipment the operators must use the same practical devices and skills.

The figure presents a variant of a standardized keyboard with a matrix (column) distribution of the keys. The figures, letters and symbols on it are placed in keeping with the frequency of their appearance in programs for YeS electronic computers and technical texts that are being processed in the automated control system, and also taking into account the anthropological, physiological and biomechanical peculiarities of the hands of the operator (these are mainly young women). Such a keyboard can be used in standardized form on various devices for coding, receiving and transmitting information that is in letters and figures. It will make it possible for the operators to code information with the speed of high-class masters of typing (ten-twelve or even fourteen-sixteen strokes per second).

The application of keyboards on hercons or electronic control blocks with elements in integrated systems makes it possible to create UPD's with a keyboard which offers new technological possibilities. For example, the "field of commutation" of the formats makes it possible to considerably reduce the number of strokes on the space keys, that is, to partially automate the process of coding programs and initial data. The format of the coded data is commuted with the help of special pins that are placed in the positional openings numbered from one to eighty. The "position counter" is intended for indicating the position of the format and the "simple symbol counter" will make it possible to code a series of the same symbols more rapidly.





If the proposed keyboard is used on a UPD for which the operator has initially made a complete set of coded words, and the codes are registered on the machine after all the symbols are checked, then for organizing this kind of work there is a switch "selection" and an execution key "KI."

The proposed keyboard has several dual keys for particular symbols and signs: the figure "zero," the space symbol, and the upper and lower registers. For the figure "zero," the space and the horizontal dash (minus) it is necessary to use two-contact keys: with an ordinary stroke on such a key the code of one symbol is perforated and with a stronger and longer pressure--the necessary series of the same codes is perforated. Since the operators frequently have to perforate a series of spaces, the lower space key is divided into two parts; such operations are more convenient and it is quicker to make alternating strokes with two fingers.

For better informing the operator about the condition of the UPD the keys of the upper and lower registers, the Russian, Latin and national alphabets, and the capital and lower-case letters must be lighted. Foot pedals are to be used for changing the registers.

When perforating commands in the basic programming languages this keyboard will require less time since the operator will not have to change from upper to lower registers when coding figures, Latin letters and many symbols, but will only have to press the key "Latin alphabet."

Calculations show that a universal keyboard will reduce the process of coding each command in programs for YeS electronic computers by eight-twelve strokes and more, which will make it possible to save two-four seconds, and this means increasing labor productivity by 25-50 percent. And if two operators working on traditional types of UPD's with an average speed of two strokes per second were to achieve on the proposed keyboard a speed of three strokes per second, this would be tantamount to having a third operator in the computer center!

In the system for electronic processing of data and receipt and transmission of information along communications channels it will be necessary to have UPD's with efficient keyboards for many years in the future. They are the more necessary since more and more specialists and managers are beginning to work directly on electronic computers.

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## NEED TO REDUCE COSTLY MACHINE PROCESSING TIME

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA  
in Russian No 8, Aug 83 (Signed to press 13 July 1983) pp 157-159

[Article by A. Ye. Gazaryan, head engineer of the Klaypeda Computer Center of the Lithuanian SSR Central Statistical Administration: "Compute More Quietly--Earn More"]

[Text] The low economic effectiveness of decentralized utilization of electronic computers has lead to the creation of a considerable number of branch computer centers (KVTs), computer centers for collective use (VTsKP), and city and rayon information computer centers (IVTs). One of the peculiarities of their operation is khozraschet relations with the users, and the main indicator is the sum of payments received for the services that are rendered. It also serves as a measure of the volume of services offered or work performed by the center which, in general, is fair as long as one is speaking about punch or keyboard computer machines. We begin to scare the "fish" and "with the fish the money" when we evaluate the operation of electronic computers this way.

The peculiarity of the existing system of accounts with the client for the processing of information on electronic computers lies in the determination of the value of the work that is performed in terms of actual expenditures of machine time within the limits of a coordinated calculation. This situation which looks innocent at first glance orients the entire mechanism for evaluation and stimulation of labor of the computer center in the original direction, to say the least.

Let us begin with the plan. Which of the two variants that provide for the same results with different expenditures of machine time is preferable for the computer center? Alas, not the one that was developed on the basis of a high level, taking into account the latest achievements in the theory of programming and the technology of processing information. It forces them to solve problems more efficiently on electronic computers, with smaller expenditures of machine time, and this means that this will be less advantageous for the computer center. And the plans are frequently developed by the computer center itself, so that in any case it has a significant influence on their selection.

But say that there is a plan. The next stage is to coordinate the planned expenditures of machine time (calculation) with the client. The actual expenditures, of course, will range around a more or less precisely predetermined value, but this value cannot be included in the calculation. In those cases when the actual expenditures of time turn out to be less than planned, the computer center gains nothing: the calculation is according to actual expenditures! And when the actual expenditures turn out to be higher than planned, the electronic computer operates...free of charge. Moreover, according to the existing accountability, it does not generally work on above-planned time since the load is calculated only according to the amount of time paid for by the client. Can one be surprised about the tendency toward increasing expenditures when drawing up calculations? And, for various reasons, the client cannot always counteract this tendency.

But finally the calculation is drawn up (with the necessary "reserve") and coordinated. The operation begins. Now what is the point in not utilizing this "reserve"? To do extra work "for the same amount of money", to augment the time that is saved or to retain volumes? The electronic computer operator who, because he is inexperienced, completes the job early must either cover this with write-ups of machine time or he must be replaced by someone who is less skillful. This is a bad joke. Nonetheless the machine time submitted to the client for payment is most frequently equal to the maximum permissible, and the actual expenditures for insurance are somewhat higher (according to the account journal for operation of the electronic computer). And nobody in the computer center or in the higher organization, as a rule, is interested in reducing these figures.

It turns out that efficiency work for improving the technology and the software which leads to a reduction of expenditures of machine time on solving a problem is inappropriate to say the least in an autonomously financed computer center. It not only does not create an economic effect at the computer center which introduces this proposal but, on the contrary, causes appreciable, easily measured harm. The situation is not much better with new technical equipment, especially if it is more efficient than the old equipment.

Is it worthwhile to continue to list the "merits" of the method of keeping accounts with the client in terms of the actual expenditures of machine time? The solution which is basically incorrect involves a chain reaction, and breaks in subsequent links have to be compensated for by artificial measures.

But why with centralized processing of information on electronic computers do they not use the ordinary methods of accounts according to planned expenditures which are determined on the basis of progressive interbranch normatives? After all, the "standard norms of time for programming problems for electronic computers" have been developed and have been in effect

since 1980. The payment for the development of the plan depends only on the description of the problem itself, and not on the actual time expenditures of the programmer, and now it is advantageous for him to be productive. Similar norms have been developed by the RSFSR Central Statistical Administration under the methodological leadership of the central bureau of norms for labor of the USSR State Committee for Labor and Wages for expenditure of machine time when debugging and introducing programs. It seems that there is a quite critical need for such single norms of expenditures of machine time for solving problems for the user of autonomously financed computer centers. And the payment for the services and the volume of work of the computer centers should be determined on the basis of precisely these publicly necessary expenditures. Even if initially the norms that are used do not turn out to be very precise, the effect from the very fact of their application will cover possible outlays one hundred-fold. And every day of delay in introducing accounts in terms of the value of services offered by computer centers means many thousands of hours of costly computer machine time that are lost in vain.

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## ECONOMIC MANAGEMENT IN BULGARIA DISCUSSED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 83 (Signed to press 13 July 1983) pp 160-171

[Article by Ivan Nikolov, professor, director of the Institute of Social Administration under the Central Committee of the Bulgarian Communist Party (Sofia): "The Economic Approach to Administration of the Bulgarian National Economy"]

[Text] Improvement of the system of administration of the national economy is at the center of the attention of the Bulgarian Communist Party. The 12th Party Congress (1981) not only considered the fulfillment of the plan of the Seventh Five-Year Plan, but also discussed the way tasks set in the party program are being fulfilled. Significant success has been achieved in industry, agriculture, transportation, trade, culture and all areas of public life. As compared to 1970 the national income more than doubled. The country's fixed capital also more than doubled. In 1981 it amounted to 82.7 billion leva. Capital investments during the current decade have exceeded their volume during the first five five-year plans approximately 1.6-fold. All this, in the words of Comrade Todor Zhivkov gives us justification to announce with pride that we have marked the first decade of the party program with the creation, figuratively speaking, of another Bulgaria, a second one.

One of the main issues developed by the Congress was the economic approach to administration of the national economy of Bulgaria. Its initial points are:

the commercial nature of production requires fuller disclosure of commodity and monetary relations (taking into account the new content inherent in them), and also the application of economic levers related to them: cost accounting profit, prices, production costs, credit, bonuses and so forth. "To underestimate the significance of commodity and monetary relations," emphasized Comrade T. Zhivkov, "--not to use them intelligently and fully--

means to deal a blow to administration and to allow trivia and voluntarism in the work of economic organizations.";\*

the utilization of all possibilities of intensive development. It becomes especially important to modernize and renovate production capacities, to have an investment policy that is oriented toward spheres that provide for accelerated technical progress, and also to motivate enterprises, collectives and executives to introduce the achievements of science and technology;

efficient and complete consumption of raw materials, processed materials and energy;

increased ability of production to compete. This is especially important in connection with the fact that more than 75 percent of the Bulgarian national income consists of foreign trade circulation.

The economic approach to administration of the national economy constitutes the essence of the principal, universal and comprehensive economic reform.

Centralized planned administration is retained as a basic principle, but it is realized in a new way, mainly through the development of global goals for the development and investment policy. The national economy consists of economically independent organizations whose activity and interrelations are regulated by common rules. According to the requirements of the economic approach, the criterion for evaluating economic effectiveness is no longer the fulfillment and overfulfillment of the plan in and of itself, but the final economic results: the profit and earnings.

The second principle of the economic approach is the changeover to autonomous financing and self-payment. Autonomous financing is primarily economic effectiveness and economic responsibility. It is impossible to speak of autonomous financing in places where money that is spent is not recouped and does not remain for accumulation and consumption.

The third principle requires that the labor of each person be paid for in close connection with his contribution to the creation of the public wealth, and the evaluation of the quantity and quality of invested labor depends not on the products that are produced, but on the products that are sold. This principle is reflected in practice in the formation of wages as a resultant and residual amount.

The economic approach presupposes extensive enlistment of workers in the administration of the national economy and the development of socialist

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\*Zhivkov, T. "Report of the Central Committee of the Bulgarian Communist Party to the XII Congress and Forthcoming Tasks for the Party," Sofia, "Sofiya Press", 1981, p 31.



democracy on an economic basis. The latter means that the economic agencies acquire economic independence whereby the relations between them and the state are ordered on the basis of common interest and mutual advantage, that is, on the basis of a contract.

The economic mechanism that is applied in the administration of the Bulgarian national economy embraces all branches of production, the material sphere and territorial units, and is arranged on the basis of the principle of economic management of public production and democratic centralism on an economic basis. The socialist state is thus the owner, and the labor collective is the master of socialist property.

The role of centralized planning becomes considerably greater in the development of the strategy of socio-economic development. When drawing up the plan one uses economic, special-purpose program and multi calculation approaches in combination with balance, normative and other methods. The bases of the plan are the national, comprehensive, special-purpose programs for raising the standard of living, developing extra-economic relations and socialist integration and also interbranch, branch and territorial long-term special-purpose programs. All this, in turn, is based on predictions, analysis and regular consultations regarding economic and scientific-technical issues with CEMA countries. The plan determines the strategic directions for the country's socio-economic development, and the ways and means of achieving them. It is developed on a national level and in the branch and territorial cross sections for five years, and it is concretized in the annual plans.

The increased centralization of planning is accompanied by a decisive democratization of it at the level of economic organizations and enterprises. They are now responsible for state planned tasks for a limited number of indicators whose fulfillment should guarantee the balances and the main proportions in the country. Moreover, the planned volume of production of an economic organization in a number of branches does not necessarily exhaust its production capabilities. Every economic organization retains a certain part of the capacities that are not loaded according to the plan, which it utilizes at its own discretion, in keeping with the demands of the market.

The main economic criterion for evaluating the economic activity of organizations is profit. It reflects the contribution of the economic organizations to increasing the national income and the effectiveness of production. It is an indicator which, in the final analysis, generalizes the result of the utilization of means of production and labor force, increased productivity of public labor, reduced production costs and improvement of product quality.

Another indicator is the mandatory currency balance. Every economic organization should provide the state with certain currency revenues which are the difference between its earnings and the expenditure of foreign currency.

Two new indicators of final results will be introduced: the goals of national comprehensive programs for scientific and technical progress and the introduction of new capacities and the modernization of existing ones at the most important national facilities. These indicators are meant to stimulate and accelerate the introduction of scientific and technical achievements and advanced practice--necessary conditions for intensive development of the economy.

The mandatory indicators for certain resources that are in short supply are also established centrally. These are limits on the main kinds of raw materials, processed materials, fuel and energy and certain kinds of machines and structures as well as limits on imports. This is done in order to guarantee state planned balances.

Thus economic organizations are provided with the necessary resources and assigned five mandatory results: the most important listed indicators, currency, profit, the fulfillment of national comprehensive programs for scientific and technical progress and the start up of new capacities and the modernization of existing ones at the most important facilities that are of national significance. All the rest of the indicators are regulated by the economic organization at their own discretion. The state does not check, for example, on the production costs, labor productivity, savings normatives, number of employees, volumes of capital investments, and so forth. The limit on capital investments was previously set for economic organizations but now the Bulgarian Council of Ministers determines the limit only for branches, and its distribution among economic organizations is carried out by the bank on the basis of a competition, during the course of which the organizations demonstrate the profitability of their activity.

#### Actual Financial Funds

The reduced number of mandatory planning indicators and the granting to economic organizations of the possibility of utilizing part of the production capacities at their own discretion considerably increases the role of the counterplan. State planned assignments provide for a correspondence between the counterplans of the economic organizations and the unified state plan for socio-economic development, but they far from completely embrace all tasks, indicators and sections of the plan of organizations, without which it is impossible to draw up a comprehensive and balanced plan. All this is reflected in the counterplan--the main instrument of the socialist economic administration, the only document according to which economic organizations and enterprises will operate. They are more interested in reviewing internal reserves and including them in the counterplan, for the final economic result and evaluation depend on this plan and not on the mandatory planning indicators which can also assign low rates of development. In order for the internal possibilities to be fully revealed, it is ordered that reserves revealed by the collectives and included in the counterplan not be withdrawn. Withdrawing them is regarded as illegal activity.

Moreover, it is envisioned that the financial base of the economic organizations be strengthened and their rights to spend their own financial resources be expanded. Three additional monetary funds are formed in the economic organizations: "economic risks," "stimulation of the introduction of scientific and technical achievements" and "expenditures of the manager." Within the framework of their own financial funds they are also given the right to operate freely with capital investments:

modernizing and renovating production, improving organization of labor, improving its conditions and delivering machines, structures, technical specifications, instruments and equipment for these purposes if the time period for the measures does not exceed a year;

for facilities and measures with a time for recouping the money for up to three years under the condition that more than 75 percent of the volume of construction and installation work is carried out through their own forces;

for delivering technological equipment, documentation, instruments, supplies and means of automation with a time period for recouping expenditures of up to three years;

for constructing facilities for social and cultural purposes with the SBKM\* fund of the enterprises.

Economic organizations have been granted the right to jointly finance measures related to production activity for the social needs of the collective with the observance of the same limitations.

The new economic mechanism significantly increases the role of contracts and contractual relations as instruments in planning. If the activity of each enterprise is planned on the basis of contacts among economic organizations, the plan will be provided with raw materials, processed materials and other means of production; there will also be preliminary planning and sales of the final product. In general the system of contracts is much more dynamic, stable and effective than the detailed system of material balances.

At the present time the state provides raw material and guarantees the sale only for those products which are included in the state planned tasks. Everything else that is embraced by the counterplan is sold by the economic organization itself. This policy will be strengthened in the future: the normative documents envision economic sanctions which force the producers to conclude agreements among themselves.

\*Soviet analog -- fund for social and cultural measures and housing construction. (ed.)

The fulfillment of agreements is also guaranteed in a new way. While previously the parties frequently forgave one another for failure to fulfill contractual commitments, now the losses caused to a specific economic organization are included in its expenditures, and it must insist on payment for them through the arbitration board.

Increased centralism, on the one hand, and expansion of economic activity on the other, have made it necessary to make essential changes in the organizational structure of the national economy. The rules for applying the economic mechanism clearly limit the functions and rights of the ministries, economic organizations, enterprises and brigades as structural units of the national economy.

The new organizational structure considerably changes the functions, position and role of the central level of administration. Branch ministries are being transformed from mainly economic agencies into purely state agencies. Their main functions include:

- to determine the strategy for the development of the branches;
- to participate in the development, discussion and adoption of five-year plans for the country's socio-economic development;
- to develop drafts of control figures and finally formulate state planning assignments for economic organizations;
- to introduce a normative base;
- to make sure that the state, scientific-technical and investment policy is adhered to in the corresponding branches;
- to improve the organizational and production structure of the branch and its administration;
- to exercise state supervision of the activity of the economic organizations.

The ministries are not allowed to intervene and violate the economic independence of the economic organizations. Their influence is limited to economic means. Administrative actions can be taken only in cases where it is necessary to avoid a failure to adhere to the state policy or when socialist property is being handled inefficiently.

#### For Wages--What Remains

The basic production, economic and social unit of the national economy is the economic organization. It is the direct recipient of the state plan and has functions of operational control which up to this point were carried out by the ministries. The economic organizations received the right to establish normatives for circulating capital and participate in

the financing of measures with a multiple effect, including in areas that go beyond the framework of their basic activity. Economic organizations can freely, on a contractual basis, form associations with the goal of more effective utilization of material, labor and financial resources.

Under the new conditions the enterprise receives a status which approaches as closely as possible the status of an economic organization. It operates on autonomous financing, is a corporate body, and can without limitations conclude contracts, and draw up the financial plan according to the rules of economic organizations, including the utilization of credit. In order to strengthen the financial base and independence of the enterprise there is to be centralization in the economic organization of only part of its funds--up to 60 percent of the fund for development and technical improvement and up to 80 percent of the amortization deductions which are used for renovation of fixed production capital.

The primary unit of the production organization is the brigade. It operates according to an annual counterplan which it draws up on the basis of compulsory planning assignments and internal reserves that are revealed. The form of work is autonomous financing. The wage fund is a resultative amount, and depends directly on the quantity and quality of products that are produced. The interrelations between brigade and the management of the economic organization (enterprise) are arranged on a contractual basis in keeping with the requirements of autonomous financing responsibility, that is, a planning and coordination agreement is concluded which determines their mutual duties and responsibilities. The side that violates the agreement pays compensation to the one that loses. Thus the brigade is actually transformed into the primary economic unit.

In the new economic approach there is a marked need for the strictest observance of the socialist principle of distribution according to labor. This is realized most fully through the requirement of forming wages as a resultative and residual amount. What does this mean, specifically? The products that are produced are sold, and from the revenues that are received reimbursement is made for production material expenditures, deductions are made into the budget, the debts of the enterprise (organization) are paid to banks and other organizations, money is deducted for the appropriate funds, and the remainder is distributed among the workers in the form of wages, taking into the account the quantity and quality of labor that has been invested. Thus the labor collectives are economically motivated to increase labor productivity, to utilize production capacities more fully, to save on raw and processed materials, and to strictly observe contractual relations. Any unfavorable economic result is directly reflected in the amount of individual wages.

#### Prices and Sales of Products

Successful introduction of the economic approach in the administration of the national economy requires improvement of the existing system of

price setting. Prices for goods and services should be determined according to the requirements of economic laws for a developed socialist society, taking into account the objective conditions wherein the products are produced and sold on the markets. This point requires the observance of two basic principles:

the prices for raw materials, processed materials, fuel and energy, and also for machines, structures and other goods that are included in foreign trade circulation are formed under the influence of prices on the foreign market;

prices for goods and services that satisfy mainly the needs of the domestic market are determined on the basis of normatively established expenditures and profit.

The economic means of influence presuppose a decisive surmounting of the monopolies of individual organizations in the sphere of production and sales of products. For this purpose, the following measures are envisioned:

economic organizations are granted the right to produce products in excess of the established compulsory planned assignments at their own discretion. Thus one eliminates the limitation on the consumer's selection as a result of the monopolistic position of many economic organizations;

each organization (enterprise) can select the means of selling products in keeping with its own economic interests: it can sell them itself, through specialized internal subdivisions or stores, or with the mediation of any sales organization. Products are sold in a similar way on the foreign market.

The development and introduction of the new economic mechanism is a large-scale political, economic and social measure. The actual relations between the state and the economic organizations, among the economic organizations themselves, between them and labor collectives, and also the interrelations among labor collectives and individual members of them are changing essentially. These new interrelations pertain to the formation of income, material goods and their distribution. But they are also of immense educational significance and create a new system of values. Making each person's income dependent on the actual amount of work he has done and on the quantity of labor recognized by the society, the economic approach precludes the possibility of obtaining unearned income and it forms a new attitude toward labor. If up to this point the criteria for evaluation were the fulfillment and overfulfillment of the plan and norm (regardless of how realistic they were), now the measure is the labor itself. Previously good managers included those who could achieve a lower plan, who "produced less and wanted more," now this type of manager is not needed. Business qualities are now determined not by the ability to "scrape up funds" but by the ability to organize economic activity in such a way as to produce a maximum economic effect.

The economic approach changes the attitude of the workers toward socialist property. While up to this point they considered it mainly their own from the political standpoint, now they more fully recognize themselves as the only authorized managers. Previously the expenditure of socialist property pertained only to the state, and not to an individual labor collective or worker. Now every worker is directly motivated in preserving and increasing it.

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## BULGARIAN MACHINEBUILDING INDUSTRY TECHNICAL INNOVATIONS VIEWED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 8, Aug 83 (Signed to press 13 July 1983) pp 172-175

[Article by Yu. I. Martynov, Soviet graduate student of the Academy of Social Sciences and Social Administration under the Central Committee of the Bulgarian Communist Party (Sofia, Voronezh): "Technical Progress in Bulgarian Machine Building"]

[Text] The decisions of the 12th Congress of the Bulgarian Communist Party envision consistently conducting technical re-equipment of production in all branches of machine building and creating machines and equipment of a high technical level which will make it possible to curtail or at least reduce the imports of such products.

The decisive form of the scientific and technical policy will be not individual measures, but an interconnected system of them in the form of nine national programs. They embrace the main areas of intensification of socio-economic life. In this connection Bulgaria has created about 400 engineering introduction organizations (IVO). Their main task is to accelerate the introduction of scientific and technical achievements and domestic and foreign advanced practice, and to raise the technical-economic and organizational level of production, to improve the qualitative and operational parameters of products, and to increase the economic and social effectiveness of the activity of economic organizations. The IVO's include: scientific research, planning and design and planning institutes, scientific centers, scientific production organizations (associations, combines, enterprises, complexes and laboratories), engineering organizations, bases for development and introduction, planning units, experimental stations, experimental bases and scientific research laboratories.

An important peculiarity of the engineering and introduction organizations is the interbranch nature of dissemination of innovations. The IVO's participate in post-start up service of technical equipment that has been introduced at the enterprise and provide author's supervision of the manufacture of new items. The IVO's not only introduce new technical equipment into production, but also train personnel for the new equipment and technological processes and control the parameters of the items during the period



of operation. This makes it possible to promptly make adjustments to the design and technology. Thus the joint work of specialists of the Institute of Electric and Motor Cars and the Combine for Producing Electric Cars imeni 6 Sentyabrya in Sofia makes it possible to develop and introduce new models every two or three years.

The development of a system of contracts helped to accelerate the introduction of scientific and technical achievements. With its introduction the enterprises and organizations assumed greater responsibility, their operational independence increased, and they had greater opportunities to display initiative when updating the list of products and concluding and fulfilling agreements. The so-called "order-contracts" lie at the basis of the counterplans that are adopted by each economic unit.

The material base, which makes it possible to accelerate introduction, is the economic incentive fund. It includes primarily the following funds: for expansion and technical improvement, stimulation of technical progress, and economic risk. The latter is of special interest. Like other funds, it is formed from deductions from the balance profit of the enterprises and is used to pay for expenditures on production activity which involves increased economic risk, and also with overexpenditure (for payment of debts, losses from underfulfillment of contractual commitments). This also contributes to proceeding rapidly through the "zone belonging to nobody" which Bulgaria understands as the lag between scientific research developments and their introduction into practice.

In conducting the scientific and technical policy a special position is allotted to one of the key branches of the Bulgarian economy--machine building. At the present time it produces about 30 percent of the industrial output and about 50 percent of the exports, while the number of employees is about four percent of all the workers. Enterprises of the branch produce more than 2000 various kinds of machines and equipment and more than 9000 items: electric and motor cars, metal processing machine tools, motor vehicles, ships for various purposes, and so forth. Machine building takes advantage of the achievements of scientific and technical progress more than other branches do. This is quite clear when one compares the dynamics of updating of products in industry as a whole and individually for the branches.

It is assumed that in the future the updating of machine building products will take place more rapidly than in other branches and in Bulgarian industry as a whole, and its subbranches will develop with the following rates of renewal: 20-25 percent--the most science-intensive (electronics, instrument building, electrical equipment), 12-15 percent--heavy machine building, and 10-12 percent--lifting and transportation.

The Bulgarian scientists relate the updating of machine building products with the intellectulization of public production, which is manifested in the following:

there has been an increased proportion of creative labor in expenditures on producing products;

the technology that is applied is based on extensive utilization of electronic computers and robots;

capital investments are directed at a somewhat more rapid rate toward accelerated development of science and science-intensive branches of material production.

The main manifestation of intellectualization in the area of economics is considered to be the automation of material production and control.

For the Eighth Five-Year Plan (1981-1985) it is intended to expand the application of automation and electronics in the production of machine building products. These tasks are going together into an overall program whose fulfillment will make it possible to reduce expenditures of manual labor by almost 50 percent.

During the past 20 years expenditures on scientific research and experimental design work in Bulgaria have increased almost thirteen-fold. They are introducing a unified system of technological preparation of production. Its implementation will make it possible to increase labor productivity by 15-30 percent and to reduce the time periods for assimilating new items, to two-thirds-one-half the previous amount.

The branch of the Central Machine Building Institute (Rusa) and the Soviet-Bulgarian Scientific Research and Planning Institute, Interprogramma, are developing program means of automation of a whole series of functions of control of the preparation and production of industrial products. These include such developments of the Interprogramma Institute as program means of automating control of the enterprise with the single and small-series type of productions; program means of filling out design and technical documentation, technical preparation of production and production planning, and so forth.

Thus when designing a new series of electric telfers for the Tesma-Gabrovo enterprise, they considered about 7000 variants of toothing, and other optimization problems were also solved. As a result, the sizes of the item were reduced and the metal-intensiveness of individual modifications of it decreased by an average of 18 percent while there was a significant improvement in the technical operational characteristics. It is also intended to develop and introduce 37 programs for comprehensive standardization for machine building items.

In keeping with the requirements of the new economic mechanisms, state standards will be approved only for strategic, structure-determining products, and the rest will be produced according to branch and plant standards

and norms. It is assumed that this will make the system more flexible and dynamic, will increase the rights and responsibilities of the enterprises and organizations, and will provide for prompt reaction to the requirements of the international market. The flexibility of the system should also be accompanied by extensive introduction of scientific and technical achievements in all branches of industry as a result of the so-called "engineering product." This includes technological processes and equipment which have been created at the enterprise and can be sold in the form either of documentation or documentation plus equipment or documentation and equipment plus installation at another plant within the country or abroad.

One of the complicated problems of the Bulgarian economy is the need for further growth of public production under the conditions of strict economizing on raw materials, processed materials, fuel and energy. During the Eighth Five-Year Plan (1981-1985) it is planned to provide for a growth of the national income of 20 percent with a considerable reduction in resource supply, including metal and other materials. The rates of development of machine building are determined largely by engineering and technical measures that provide for efficient and effective utilization of materials used in production--these are being developed and introduced by the Central Machine Building Institute. Under the Seventh Five-Year Plan a program was developed which consists of 890 engineering-technical and organizational tasks, such, for example, as improving existing designs and technologies and introducing new ones; progressive changes in the structure of machine building products; the application of new, highly effective materials; type establishment, unification and standardization of materials and items; improvement of their transportation and storage; improvement of organization and planning of material and technical supply, and so forth.

Further introduction of scientific and technical achievements into production is regarded in Bulgaria as inseparably connected to international division of labor and socialist economic integration. In 1981-1985, within the framework of the General Plan for Specialization and Cooperation in the area of material production, they have agreed upon cooperation with the Soviet Union regarding 450 problems and subjects. About 80 percent of them are of an applied nature, and 84 subjects envision the creation of new machines and equipment, and 78--new and modernized technological processes. More than 150 Bulgarian and about 200 soviet scientific collectives and organizations are participating in the cooperation.

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## QUESTIONS ADDRESS WASTE, ITS EFFECT ON WORKERS & THEIR PAY

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA  
in Russian No 8, Aug 83 (Signed to press 13 July 1983)p 176

[Article: "Rejects and Payment"]

### Questions

1. Production rejects are products that are manufactured with violations or deviations from the standards and technical specifications. Rejects constitute one of the indicators of the level of labor discipline. On what does payment depend, as it is regulated by article 93 of Labor Code?
2. At one of the plants, in order to deal with cases of rejects, they are creating a commission which determines the blame of the worker, after which he is held materially responsible. Is a conclusion by such a commission sufficient?
3. If a worker has not confirmed his guilt for rejected work in writing but the administration is convinced of it, how does one make sure that the worker is justly punished?
4. If it has been proved that the worker is guilty of slipshod work, he is materially penalized. What is done in the opposite case?
5. Rejected work that is entirely the fault of the worker is not paid for at all, but he is held materially responsible for the spoiled material. How then is payment made for frequent slipshod work by the fault of the worker?
6. A worker who is guilty of producing rejected work can be held materially responsible. What is the maximum amount of this responsibility?
7. Frequently rejected work is not the fault of the worker or employee. How are the products paid for in these cases?
8. What guaranteed payment can the worker or employee count on if he has had a rejection that is not his own fault?

9. It is generally thought that for work that is rejected the worker or employee receives payment at a reduced rate. Are there cases when the rejected work is paid for in the same amount as for suitable products?

10. One member of the brigade has submitted rejected work, and the entire collective is punished. Is this punishment fair?

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ANSWERS TO QUESTIONS ON WASTE POSED ON PAGE 176

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA  
in Russian No 8, Aug 83 (Signed to press 13 July 1983) p 188

[Article: "Rejects and Payment"]

Answers

1. The payment for rejected work depends on whose fault it was and on whether the rejection is complete or partial.
2. In order to hold a worker materially responsible for rejected production work it is necessary to have his written agreement and admission of his own guilt. The authority of the commission, consequently, can be insufficient.
3. In the event that a worker refuses to confirm in writing his own guilt for slipshod work, the administration has the right to sue him in the people's court.
- ✓ 4. If they do not manage to prove the guilt of the worker for the rejected work (or not enough effort is exerted to do this), the losses are included in the cost of the product.
5. Partially unsuitable work which is the fault of the worker or employee is paid for in a reduced amount--depending on the degree of suitability of the manufactured product.
6. The overall amount of responsibility for producing unsuitable work cannot exceed two-thirds of the average monthly earnings of the worker.
7. When the work is completely rejected and it is not the fault of the worker, the work is paid for in the amount of two-thirds of the wage rate of a time-rate worker of the corresponding category, or when it is partially rejected--depending on the degree of suitability of the product but no less than two-thirds of the aforementioned wage rate.

8. The monthly earnings of the worker who has manufactured the product that has been rejected through no fault of his cannot be lower than the established minimum amount.

9. The rejection of items because of a defect in processed metal (inappropriate quality of material, a bubble or crack in the metal) which was revealed after no less than one working day was spent on processing or assembling the part, is paid for at normal piece-rate wages. Rejected work which is not the fault of the worker which is discovered after the item is received by the technical control agency is paid for to this worker in the same amount as for suitable items.

10. Frequently in practice they apply the so-called "collective material responsibility." This approach to stimulating quality is acceptable if, however, it is correctly used. On the whole it is more reasonable to provide incentives for improving quality, and not to give punishment for reducing it. Moreover one should encourage not only those who are constantly improving quality, but also those who help their comrades in this, which also makes it possible to achieve collective material responsibility.

Preparing the material we used: the RSFSR Labor Code, Moscow, "Yuridicheskaya Literatura," [Legal Literature], 1976.

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